information base

GREENBELT PARK

MARYLAND

INFORMATION BASE

for a

DEVELOPMENT CONCEPT PLAN/GENERAL MANAGEMENT PLAN

GREENBELT PARK, MARYLAND

June 1980

Prepared
by the
Denver Service Center/National Park Service
United States Department of the Interior

As the nation's principal conservation agency, the Department of the Interior has basic responsibilites to protect and conserve our land and water, energy and minerals, fish and wildlife, and parks and recreation areas, and to ensure the wise use of all these resources. The department also has major responsiblity for American Indian reservation communities and for people who live in island territories under U.S. administration.

United States Department of the Interior/National Park Service

N

Photograph taken June 14,1979

500 0 500 1000 1500 2000 Feet

200 100 0 200 400 600 Meters

AERIAL PHOTO
GREENBELT PARK
MARYLAND

843	40,050
DSC	JUNE '80

UNITED STATES DEPARTMENT OF THE INTERIOR / NATIONAL PARK SERVICE

Park boundary	
Other NPS Boundaries	
Corporate boundary	Corp.
Park road	
Foot trail	
Horse & foot trail	
Building	
Stream	Creek
Intermittent stream	Creek

N

500 0 500 1000 1500 2000 Feet

200 100 0 200 400 600 Meters

PARK MAP

GREENBELT PARK

MARYLAND

UNITED STATES DEPARTMENT OF THE INTERIOR / NATIONAL PARK SERVICE

843 | 40,031
DSC | JUNE '80

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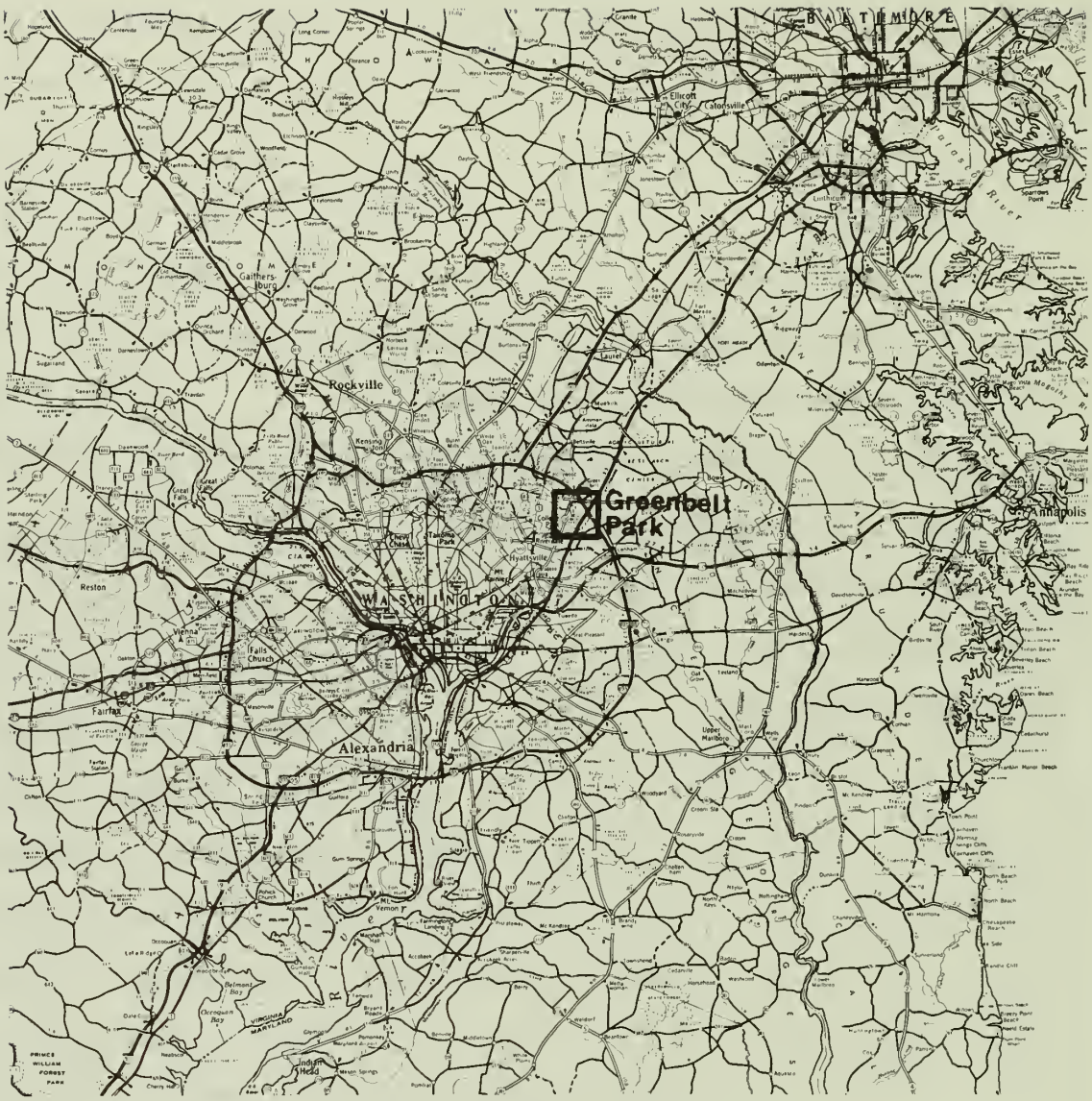

LEGEND

PARK LOCATION

CITY

TOWN

COUNTY SEAT

STATE ROUTE

FEDERAL ROUTE

INTERSTATE

5 0 5 10 MILES

8 0 5 10 15 KILOMETERS

N

REGIONAL MAP
GREENBELT PARK
MARYLAND

843 | 40,032
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UNITED STATES DEPARTMENT OF THE INTERIOR / NATIONAL PARK SERVICE

INTRODUCTION

INTRODUCTION

Greenbelt Park offers its visitors over 1,000 acres of wooded retreat from the extensive urbanization, which surrounds it (aerial photo). The Park was acquired in December of 1950 pursuant to Public Law 81-643, which established the Baltimore-Washington Parkway. (Appendix A).

Situated in Prince George's County, Maryland, the Park is bordered on three sides by major thoroughfares. The Baltimore-Washington Parkway bisects it into a 720-acre West Park and a 280-acre East Park, which are connected only by a culvert passing beneath the Parkway. The Park's northeastern corner is occupied by a cloverleaf interchange of the Capital Beltway (Interstate 495).

These major traffic arteries along the perimeter of the site, especially the Capital Beltway and the Baltimore-Washington Parkway, associate the Park with one of the most heavily travelled highway corridors of the Nation. The Beltway and U.S. Route 1 carry most of the overland vacation and visitor traffic coming into the National Capital area from the population centers of the northeast. Access to the Park from the Capital Beltway is via Kenilworth Avenue (Maryland Route 201) and from the Baltimore-Washington Parkway via Greenbelt Road (Maryland Route 193). Because of the Park's proximity to these traffic corridors and to the Nation's Capital, which lies approximately 15 miles to the southwest, it draws visitors not only from the Baltimore-Washington area, but also from the entire United States and Canada.

Primary visitor activities include picnicking, camping, and nature study. Joggers and bikers also use Park roads and trails. Special horse-and-foot trails are available for hiking and horseback riding. An area for field sports is provided at one of the picnic areas, as well as a stage for outdoor performances.

Interpretive programs have included concerts, nature walks, environmental study and campfire gatherings. Campers frequently use the Park as a place to stay, while visiting Washington, D.C.

All visitors arriving by car enter the West Park from Greenbelt Road, which borders the Park to the north. Hikers and bikers may enter here, from the commuter bicycle path that parallels the southern edge of Greenbelt Road, or they may enter from Good Luck Road, which forms the Park's southern boundary. Visitor circulation through the west Park is along a main, paved Park Central Road and 12 miles of trails. The East Park is undeveloped except for a fire road, which crosses through it from south to north, and several meandering paths.

The main orientation point for visitors is a combined Park Headquarters/Park Police Substation located near the Greenbelt Road entrance. Two-hour visitor parking is available here and information and brochures may be picked up in the Headquarters building. Park Police stationed in the Park are in charge of law enforcement on the Baltimore-Washington Parkway, as well as within Greenbelt Park. The maintenance facility located nearby also services both the Parkway and Park.

From the Headquarters visitors may continue along a loop of Park Central Road to either of three picnic areas, or continue to a family campground. A special parking area is situated along the road at the entrance to the Dogwood Trail, along which nature walks are frequently led by a Park ranger.

Near the family campground, in the southern end of the Park, is an Environmental Study Area (ESA), one of the first such areas to be located in a National Park. A group campground is accessible from Good Luck Road. A Y-shaped parcel, called the Jaeger tract juts into the West Park from Kenilworth Avenue. Two-thirds of this property has been extensively developed into a highrise, townhouse community known as Westchester Park. The remainder of the tract, approximately 36 acres, has been or is in the process of being transferred to the Park Service. An additional parcel extends into the West Park from Good Luck Road. It contains a private residence and several outbuildings.

Over 60 percent of the land adjacent to Greenbelt Park is in single-family dwellings. Bordering the Park to the east is the Kingswood Subdivision. Surrounding communities also include Spring Hill Lake and Greenbelt to the north, Berwyn Heights to the west, and Riverdale Heights and New Carrollton to the south. Extensive additional residential development is underway, with concomitant development of shopping centers, and institutional facilities. The University of Maryland's main campus lies two miles to the west. Located close by, to the northeast, are large Federal installations including the U.S. Department of Agriculture's Beltsville Research Center, (BARC), Fort George G. Meade, the Department of Interior's Patuxent Wildlife Research Center (PWRC), and the Goddard Space Flight Center, operated by the National Aeronautics and Space Administration (NASA). The relationship of these areas to the Park is shown in the vicinity map on page 50.

Located within a 10-mile radius of Greenbelt Park in Montgomery and Prince George's Counties, Maryland, are 58 small local parks and 7 stream valley conservation parks administered by the Maryland National Capital Park and Planning Commission. These parks serve primarily neighborhood and local needs. Wheaton Regional Park, also administered by the Commission, lies within the 10-mile radius to the northwest. Facilities available in these areas include softball, baseball, tennis, and numerous playgrounds, picnic sites and open play fields. Most facilities function from community recreation centers and playgrounds. Two public golf courses are available (Regional Open Space Network, page 14).

The Maryland Department of Transportation is considering the construction of an underpass-overpass at the Kenilworth Avenue-Greenbelt Road intersection, which may require the use of 1.88 acres of Park land and may impact several additional acres. It will also entail temporary easements over 0.6 acre. This will permit more extensive development of the "Golden Triangle", a wedge of land directly opposite the Park entrance. A transfer of the Baltimore-Washington Parkway to the State of Maryland is also being considered.

A Development Plan was prepared for Greenbelt Park in 1958 and the present facilities were the result of implementation of the portions of this plan relating to West Park and Parkway maintenance facilities and picnic and camping areas. This plan also proposed a visitor's center and amphitheater,

creation of a small lake, an organized recreation area, acquisition of the Jaeger Tract and location of a transient information center/Park Police Substation along the Baltimore-Washington Parkway near the Good Luck Road entrance. It was also proposed that a court games area and golf course be constructed in the East Park with access from Good Luck Road.

In 1967 this plan was superseded by a Master Plan, which proposed more extensive development of the East Park. This development was to include not only a golf course and clubhouse complex, but also a swimming center, three-and-one-half mile bicycle trail, and a recreation center. West Park facilities were to be expanded to include additional picnic sites, a day use-organized camping area, additional family campsites, a hostel, a group campground, a stable and corral and eight employee residences. This plan was never implemented.

In 1972 a proposal was made to develop the East Park into a children's theme park to be incorporated into a larger Greenbelt National Recreation Area. This plan was to be implemented as part of the Nation's bicentennial celebration and was to include development of portions of the Beltsville Agricultural Research Center and the Patuxent Wildlife Research Center. This plan was also never implemented.

According to National Park Service Management Policies, such plans must be reviewed every five years. Since no review was made of either of these proposed plans, they are no longer valid and a new combined Development Concept Plan and General Management Plan must be prepared for Greenbelt Park.

This Information Base is intended to provide basic data necessary for the preparation of such a plan. In the interim the Park will continue to be managed by an area manager according to the Statement for Management for Greenbelt Park (appendix B). The Park Superintendent's office is located in Catoctin Mountain Park, near Thurmont, Maryland, since he is responsible not only for the management of Greenbelt Park, but of Catoctin Mountain Park and the Baltimore-Washington Parkway as well.

5 0 5 10 MILES

8 0 5 10 15 KILOMETERS

N

REGIONAL OPEN SPACE NETWORK

GREENBELT PARK

MARYLAND

UNITED STATES DEPARTMENT OF THE INTERIOR / NATIONAL PARK SERVICE

843 | 40,033
DSC | JUNE '80

MANAGEMENT OBJECTIVES

MANAGEMENT OBJECTIVES

The purpose of Greenbelt Park is to provide overnight camping facilities to meet the needs of individuals, families and groups visiting the Nation's Capital, to serve as a regional park for residents of the Nation's Capital area by providing a program of day-use recreation, picnicking and interpretation, and to preserve, by appropriate management, the area's remaining natural resources so that visitors may enjoy recreational experiences in a natural and pleasant environment.

The following management objectives have been developed to achieve these goals:

1. Manage Greenbelt Park as an outdoor recreational area encouraging visitor activities compatible with the limited space and natural qualities of the Park.

2. Provide interpretive programs directed to the needs of both local and national visitors and which relate to the park environment and its setting in a large urban community.

3. Develop a complementary system of bike and hiking trails in the Park that would link with regional trails being planned by Maryland National Capital Park and Planning Commission (MNCP&PC) and other local government agencies.

4. Maintain the Baltimore-Washington Parkway as a scenic National Park Service Parkway until it is reconstructed and transferred to the State of Maryland.

5. Maintain the natural character of the park as a resource of special value for green space usable for limited outdoor recreational programs.

6. Participate in the overall planning of recreational developments with county and local citizen groups to prevent duplication and coordinate cooperative activities with county and local citizen groups.

7. Get involved with the school systems of neighboring communities in a program of awareness of the environment ethic through environmental education activities.

Greenbelt Park is presently divided into the following management zones:

1. Access and Circulation Development: areas in which paved roads and parking lots are located.

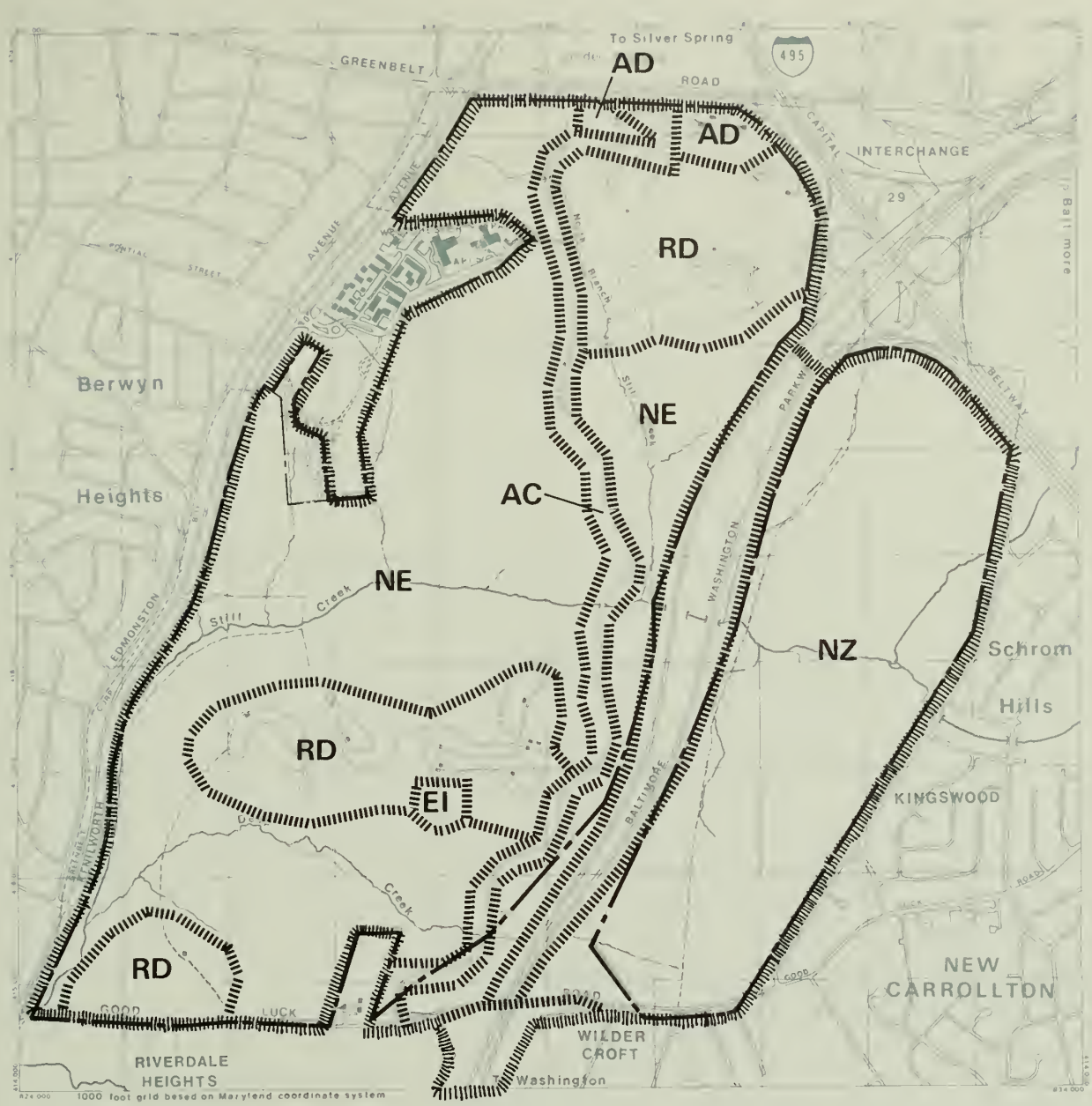
2. Administrative Development: areas containing Park and Park Police facilities.

3. Educational and Interpretive Development: areas encompassing facilities which are capable of providing groups of visitors with interpretive and educational programs.

4. Recreational Development: areas in which camping, picnicking, and sports activities may take place.

5. Natural Environmental: areas which have been developed, in a manner compatible with the natural resource, to provide the visitor with a meaningful, enjoyable, and nature-oriented, outdoor experience.

6. Natural: areas which have been left undisturbed because of their natural resources significance.



AC - Access/Circulation development

AD - Administrative development

EI - Educational/Interpretive development

RD - Recreational development

NE - Natural environmental zone

NZ - Natural zone

N

500 0 500 1000 1500 2000 Feet

200 100 0 200 400 600 Meters

MANAGEMENT ZONES
GREENBELT PARK
MARYLAND

UNITED STATES DEPARTMENT OF THE INTERIOR / NATIONAL PARK SERVICE

843 | 40,027
DSC | JUNE '80

VISITATION

Greenbelt Park is one of the few national parks within the metropolitan Washington area remaining essentially natural in character. Consequently, Greenbelt serves as a retreat for national and local visitors wishing to escape the congestion of metropolitan environments.

About 60 percent of Park visitation orginates from outside the Washington Metropolitan Area, with the remaining 40 percent representing either local or regional use. Most of the national visitors use Greenbelt as a base camp for their daily expeditions to the Nation's Capital. The duration of the stay of the national visitor ranges from a few days up to fourteen days, however, four to five days seems to be the norm. During the summer months, length of stay is restricted to five consecutive days. The local and regional visitors camping in the Park average one to three days, many coming to camp for the weekend with their family. The average group size for both the national and local visitors that camp in the Park ranges between three and four people usually of family affiliation. Of the local visitors engaging in day-use activities, approximately half are of high-school age and usually come in couples or small groups and participate in unstructured field sports such as frisbee, softball, football, etc. The other 50 percent of park visitors are either young adults or adults that come primarily for jogging, biking, hiking, and picnicking. Most day-use visitors remain in the park for two to three hours with more lengthy stays occurring on the weekends.

VISITOR ACTIVITIES

Picnicking

Three developed picnic areas -- Holly, Sweetgum, and Laurel are available for family and group picnicking. The Holly area may be reserved for group picnics; Sweetgum and Laurel areas are on a first-come first-served basis. Each offers comfort stations, picnic tables, and fireplaces.

Camping

Greenbelt's 174-site family campground is open all year. Facilities are available for tents, recreation vehicles, and trailers up to 30 feet long. Comfort stations, tables and fireplaces are provided, but there are no utility connections. Camping is limited to a total of five days from Memorial Day through Labor Day and to a total of 14 days the rest of the year. A fee of $2.00 per site per night is charged. In summer, the campground is usually filled to capacity by nightfall. A group camping area, Camp Sassafras, is open to youth groups from spring through fall. Reservations are accepted. Sassafras (also called Conestoga) consists of two sites, each capable of accommodating between 20-30 campers. Only pit toilets are available.

Nature Trails

Three trails, totaling approximately four miles, serve to familiarize the visitor with the natural and cultural resources of the Park.

Azalea Trail: A 1.2-mile loop connecting the three picnic areas, this trail offers a glimpse of the various of plant life in the park. It includes a stretch along the north branch of Still Creek where wildlife can be seen.

Blueberry Trail: Primarily for campers, this 1.2-mile circuit begins in the campground near the entrance station. A cross-section of abandoned farmland, mature forest, and marshy stream bottom characterize this area, which is used as the park's Environmental Study Area during the school year.

Dogwood Trail: Ecology, early uses of plants, and man's influence on the land are some of the stories told along this 1.4-mile trail. The trail begins at the parking area midway through the park on Park Central Road. Self-guiding leaflets are available.

Other Trails: Nearly 12 miles of well-marked trails provide access to most sections of the park, bringing visitors in contact with may outstanding natural features. A six-mile loop which has also been designated as a bridle trail, circles the western half of the park.

Biking

Presently, there are no designated bike trails within the park, however, during peak visitation, one lane of traffic along portions of the park road is restricted to bike use. The source of bike use in the Park derives from: (1) campers and picnickers who bring their bikes into the Park on racks, (2) bikers whose trips originate outside the Park and who travel along county bike trails that connect the Park with locations throughout neighboring communities. Current plans of the county call for expanded programs for bike trails that would provide access to the southern as well as the northern portion of the Park.

Interpretive Services

During Spring, Summer and Fall, a full program of interpretive services including guided walks, talks and evening programs is offered. Many of the programs, particularly the evening programs, are held at Campfire Circle, the site of the Park's amphitheatre. The interpretive programs cover a broad range of topics focusing on natural and cultural features. Additionally, the Park has an expanding program of special events that range from performances by the National Symphony to informal sessions by local Blue Grass bands.

VISITOR COUNTS

Greenbelt Park receives approximately 600,000 visitors annually representing about 2,800,000 visitor hours in the park. Understandably, summer visitation is the highest averaging about 100,000 visitors per month during June, July, and August. During 1978, June was the peak month with approximately 117,000 visits and December was the low with only about 4,000 visits. The above figures are based upon a passenger per vehicle multiplier of 3.5. The monthly variations in visitation are graphically displayed on the following page.

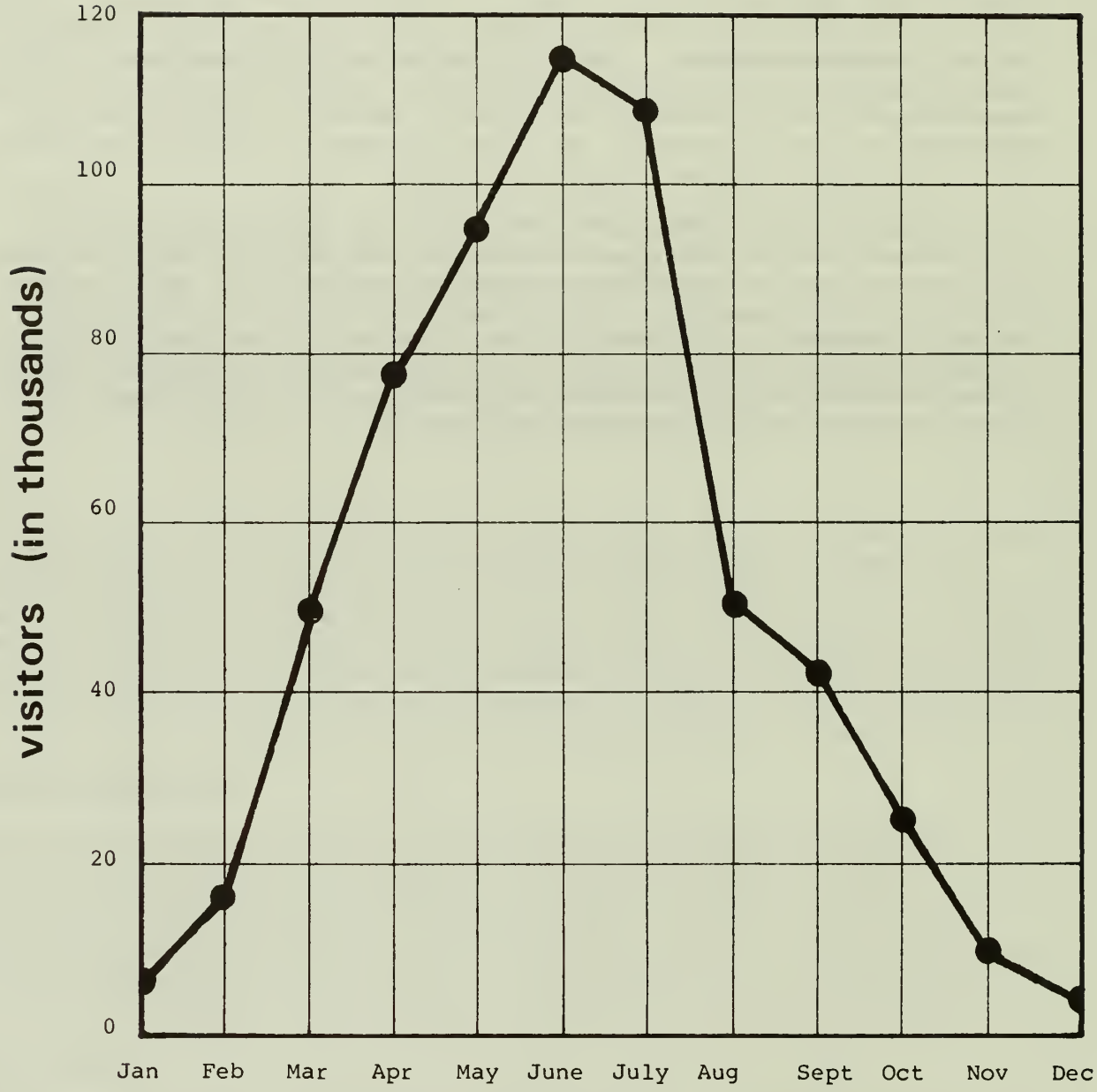
VISITOR COMMENTS

Visitors who camp in the Park have an opportunity to comment on park conditions by writing their comments on the back of the park information sheets and submitting these forms to the park staff. A tabulation of the comments received over the past four years indicates that a desire for showers and hot water was the most frequent response. Ironically, a desire to keep the Park in its present natural state without showers, hookups or similar conveniences was the second most frequent response. The need for better signing, the need for dump stations, and the need for partitions and doors in the restrooms were, collectively, the third most frequent response.

In addition to camper comments, the Park staff has maintained a file of letters received from individuals inquiring about Greenbelt Park. The greatest number of inquiries related to camping reservations, either asking if reservations were accepted or actually making reservation application. The next major category was requests for park information, brochures and maps. The third greatest number of requests were for tourist information relating to Washington, D.C., combined with inquiries regarding public transportation between the parks and the national capital area.

Monthly Variation in Visitation

(1978)



Figures are based on a passenger per vehicle multiplier of 3.5.

CULTURAL RESOURCES

SITE HISTORY

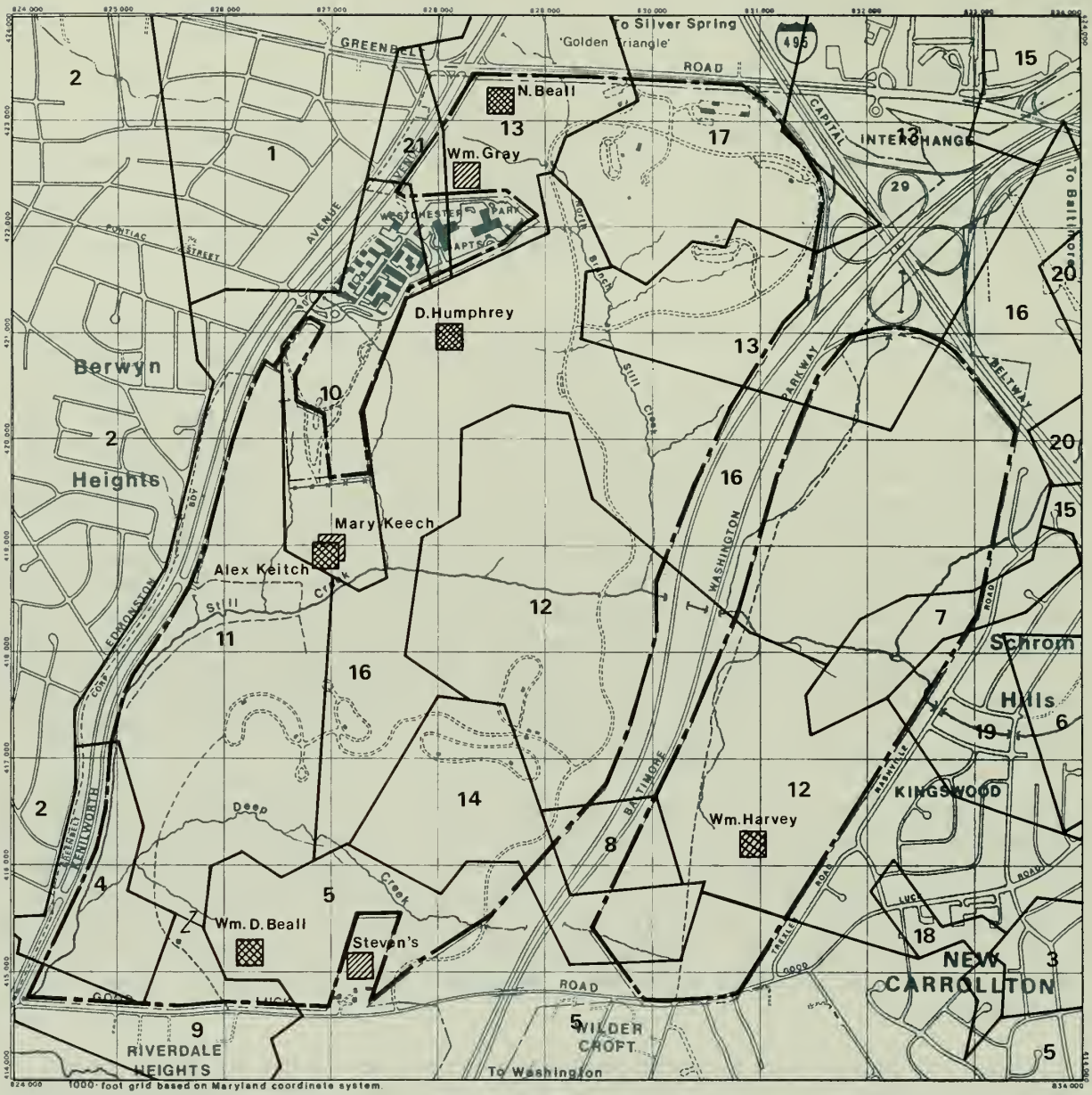
There has been no attempt at a systematic survey of either prehistoric (Indian) or historic sites. Wayne Clark, the archeologist for the Maryland Historic Trust, made a brief survey along North Branch-Still Creek in the western portion of the park, and found one lithic flake and several historic ceramic shards which may indicate both prehistoric and historic use of the park area.

The earliest map which includes this area is that of Captain John Smith, published in 1612. Hundreds of Indian villages are located on this map along major rivers and streams, and further identified by the Indian name. Greenbelt, being inland, was not investigated by Smith. Historic maps (Martenet, 1861 and Hopkins 1878) identify house sites with the occupant's name, although neither building clusters nor land tracts are delineated. According to the 1861 map, there were several houses in the area west of the Parkway, and only one house site in the 300 Acres (that of William Harvey). By 1878, several sites changed hands (as indicated by name changes) and the William Harvey place is not shown at all. While Smith's 1606 map is not specifically helpful because of its inland and therefore relatively inaccessible position for Smith, the map does indicate a sizable Indian population in this area, therefore increasing the likelihood of prehistoric sites in the park. Judging from recent archeological work in this area, it it likely that some prehistoric sites will be found adjacent to the streams that run through the park.

Still Creek, a tributary of the Northeast Branch of the Anacostia River, bisects the park east-to-west. Several smaller streams drain into this Creek, including four stream beds in the 300 Acres, two of which are intermittent. Due to reforestation of the park, archeological sites may be obscured and difficult to locate. There are no verified sites in the park. Nothing has been registered with the Maryland Geological Survey, and nothing has been nominated to the National Register. An archeological report is included in Appendix C.

The warring Seneca and Sinnebanna Indian tribes are known to have passed through the area now encompassed by Greenbelt Park. The first non-Indian settlers hunted and fished the area, but later turned to tobacco farming. This activity was so prosperous that one of the Nation's largest tobacco ports was located within only a few miles of the Park. Improper farming techniques, resulted in loss of the fertile topsoil and, by the early 1800's, eroision of topsoil had filled in the port and farmers had abandoned the land (Farm Sites map, page 30).

In 1935 this land was sold to the Federal government for an average price of $95 an acre and became open space. In an attempt to find alternatives to the then current pattern of urban development, the government embarked upon the "Greenbelt Town" concept. The Resettlement Administration planned four satellite communities. One of these communities was planned for the submarginal



This map attempts to reconstruct the original location of the first land patents issued by the State of Maryland in the park area. With the limitations of our source material, and the unknown nature and number of changes over the past 285 years to the landmarks we could locate and identify, it was not possible to provide a completely reliable map of those land patents as they relate to existing conditions. However, the map is sufficiently accurate to locate general areas of potential historical and archaeological interest which could be located by field surveys.

	YEAR	PATENT TITLE	ACRES
1.	1694	Part of Friendship	856
2.	1713	Part of Yarrow	369½
3.	1713	Valentine Garden	40
4.	1723	Denmark	
5.	1724	Hog Pen Enlarged	435
6.	1733	Elizabeth	40
7.	1744	Strife	31
8.	1745	Bee Tree	25
9.	1751	Pleasant Hills	300
10.	1753	Addition to Yarrow	126
11.	1756	Add. to Pleasant Hills	300
12.	1756	Smith's Neglect	337¼
13.	1760	Snowden's Discovery	500
14.	1761	Mary's Choice	94
15.	1771	Hamilton's Purchase	
16.	1771	Clover Farm	735¼
17.	1773	Toaping Castle	
18.	1776	Bealls Conclusion	17
19.		Part of Clover Farm	
20.		Pindles Chance	
21.		Vacant land	

Approx. residence location 1861

Approx. residence location -1878

SOURCES:
- Oct. 1970 reproduction of a portion of a map by M. Pook, undated, from State of Maryland Land Records Office.
- 1861 map by 'Martenet'
- 1878 map by G.M. Hopkins titled 'Vansville Dist. No. 1'.

N

500 0 500 1000 1500 2000 Feet

200 100 0 200 400 600 Meters

FARM SITES
GREENBELT PARK
MARYLAND

UNITED STATES DEPARTMENT OF THE INTERIOR / NATIONAL PARK SERVICE

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lands now comprising the Park site and the city of Greenbelt. The existing town was developed on the northern portion of the site in 1937 with the present Park site slated for future expansion.

Pursuant to Public Law 81-643, dated August 3, 1950, establishing the Baltimore-Washington Parkway, Greenbelt Park was acquired in December of 1950 by transfer of lands from the U.S Farm Security Administration (FSA), Department of Agriculture, to the Department of Interior. The National Park Service held concurrent jurisdiction over the Park with the FSA. A U.S. Commissioner's office and courtroom was maintained in the U.S. Park Police substation, built in the Park in 1965. This facility has since been relocated outside the Park and the Police substation retained. This structure is now shared with Greenbelt Park staff and the National Park Service has assumed complete jurisdiction over Greenbelt Park.

For nearly three weeks in July 1978, Greenbelt Park was the site of The Longest Walk encampment. The People of The Longest Walk, who represented more than 80 nations, left Sacramento, California, on February 11. They arrived in Washington, D.C. on July 13. The purpose of the walk was to protest what was referred to as "termination legislation" before Congress, legislation such as the "Native Americans Equal Opportunity Act of 1977" that would abrogate existing treaties and end the sovereign relationship between Indian nations and the government, or other that would curtail Indian fishing and hunting rights.

From July 13-29, 1978, Greenbelt Park was occupied by approximately 3,000 participants in the "Longest Walk". The Indian contingent of this group was headquartered at the family campground. Non-Indians used the group campground, Camp Sassafras/Conestoga.

In February 1979, during the Agricultural Movement's tractorcade to Washington, D.C., approximately 40 tractors and accompanying vehicles occupied the family campground. The tractorcade was organized to protest federal farm policy. Individuals using the campground represented several, primarily agricultural, States.

EXISTING FEATURES

Man-made features within the West Park boundaries include a combined Park Headquarters/Park Police Substation located near Greenbelt Road. A fenced maintenance area with two enclosed structures and a bulk storage shed are located east of this building. There are 37.88 miles of primary and 2.17 miles of secondary road within Park boundaries.

The National Park Service owns the water, sewer, and electrical lines within the Park. Commercial companies provide maintenance services on a reimbursable basis. The Washington Suburban Sanitary Commission furnishes the water and sewer services. Potomac Electric Power Company provides electrical services. A 15-inch sewer line extends 22,400 feet along the southern perimeter of Park Central Road. There are two sewer systems and two water systems, the latter consisting of 16,961 feet of pipe line. Two systems, which include 3.73 miles

of cable, provide electricity to the Park. A paved two-lane Park Central Road bisects the West Park from Good Luck Road to the south to Greenbelt Road to the north. At the Park's northern end the road loops around three picnic areas, Sweetgum, Holly, and Laurel. These areas contain approximately 250 picnic tables. In addition there is an open playing field, a ballfield and a stage at the Sweetgum picnic area. The Holly area may be reserved for group picnics. The Sweetgum and Laurel areas are available on a first-come first-served basis. Each offers comfort stations, picnic tables, and charcoal fireplaces.

The 174-site family campground is located in the southern portion of the West Park and is accessible from Greenbelt Road. It is open all year. It will accommodate tents, recreation vehicles, and trailers up to 30 feet in length. Restrooms, tables, and fireplaces are provided, but there are no utility services to the campsites.

The group campground, called Camp Sassafras or Conestoga, formerly used by the scouts is accessible from Good Luck Road. It contains picnic tables, pit toilets and water faucets, as well as charcoal grills.

A trailer ranger station and fee collection booth are located near the campground entrance. Another trailer, which serves as a ranger residence, is located adjacent to the campground entrance road.

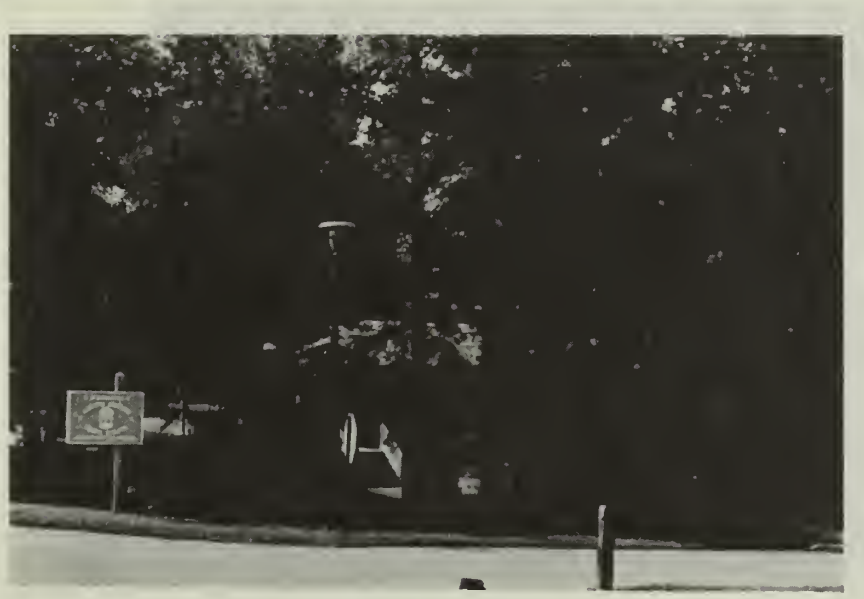
Twelve miles of trails crisscross the West Park. These include a six-mile horse-and-foot trail. The three picnic areas are connected by a 1.2 mile loop Azalea Trail. Near the family campground is a 1.2 mile circuit Blueberry Trail, which is part of the Environmental Study Area (ESA). It encompasses approximately 70 acres of woodland. The trail begins and ends near site C-20 in the campground. It connects ten study sites. Permits for use of the ESA are issued at the Park headquarters.

A third trail, the Dogwood Nature Trail, is accessible from a parking area located just beyond the picnic loop on Park Central Road. It is 1.4 miles long and is frequently used for nature walks led by park rangers.

The East Park is undeveloped except for a fire-road, which bisects it from south to north. Several paths have been worn by individuals entering the Park from the Kingswood subdivision along its eastern edge.

The East and West Park are connected by a culvert, situated in about the middle of the Park, which passes beneath the Baltimore-Washington Parkway.

Greenbelt Road
Entrance



Visitor Entrance

COMBINED PARK HEADQUARTERS/
PARK POLICE SUBSTATION

Visitor Parking

Staff Parking

COMBINED PARK HEADQUARTERS/ PARK POLICE SUBSTATION

Golden Triangle
Development Site

Capitol Cadillac
Dealership

VIEWS FROM GREENBELT ROAD ENTRANCE

MAINTENANCE AREA

Campground
Ranger Trailer

Campground
Ranger Station

PARK STAFF FACILITIES

Entrance

Camp Sites

FAMILY CAMPGROUND

Entrance from
Good Luck Road

Picnic Area

Camp Site

Pit Toilets

GROUP CAMPGROUND

Entrance

Comfort Station

SWEETGUM PICNIC AREA

Ballfield

Typical Site

SWEETGUM PICNIC AREA

Horseback Riding
and Hiking

Nature Study

WEST PARK TRAILS

Outdoor Stage

Campfire Circle

INTERPRETIVE FACILITIES

View of
Westchester
Development

Present Condition

JAEGER TRACT

West Park from
Good Luck Road

Kenilworth Avenue
Entrance

East Park from
Good Luck Road

East Park from
Nashville Road

POTENTIAL VEHICLE ACCESS POINTS

SOCIOECONOMICS

SOCIOECONOMICS

REGIONAL

As Greenbelt Park receives visitation from the entire Washington Metropolitan Area, it is necessary to look at the region as a whole and determine the possible effect changes in the demography of the area may have upon the need for future park facilities and activities.

The Washington Metropolitan Area (WMA) includes Montgomery and Prince George's counties, Maryland; the District of Columbia; and Fairfax, Loudon, and Prince William counties and the cities of Alexandria, Falls Church, and Fairfax in Virginia.

In terms of demographic characteristics, Metropolitan Washington is unique because of the concentration of Federal activities and related industries which have served as a magnet for people. However, many of the influences operating to the disadvantage of the north central and northeast states (concentrations in slow growth industry, environmental and social problems, high taxes are occurring in the Washington area. These probably will dampen the expansion of the area's population by reducing the number of people moving into the area. In fact, the Census Bureau estimated that there was a net out-migration from the Washington Metropolitan Area, between 1970 and 1974 of 13,500 people, thus reversing the long-term trends of recent decades when the area had substantial number of in-migrants (Maryland National Capital Park and Planning Commission). The population of the Washington Metropolitan Area is estimated to have reached 3,072,000 persons as of July 1, 1978.

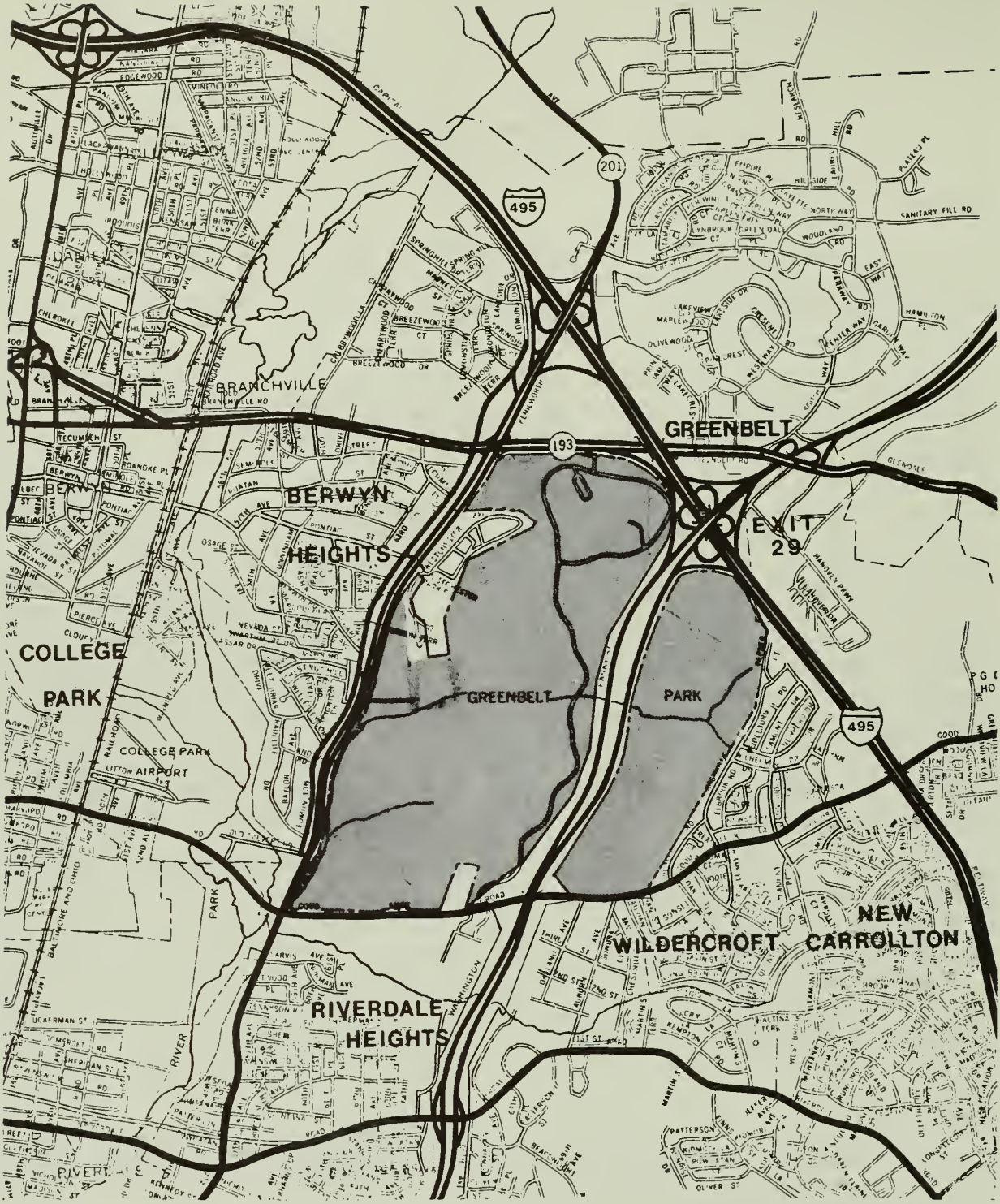
The following population projections for the WMA have been prepared (Feb.1979) by the Metropolitan Washington Council of Governments (COG).

1980 - 3,175,000
1985 - 3,447,000
1990 - 3,723,000
1995 - 3,971,000
2000 - 4,208,000

Education

The WMA population is well-educated, surpassing the national average. In 1970 the median school years completed was 12.7, 0.4 years greater than the average for all SMSAs of 300,000 people or more.

The median school years completed in the Washington Metropolitan Area also exceeded the national average (12.1 school years) by 0.5 years. There has been a significant increase in educational achievements in the WMA since 1970 with the number of adults with less than a high school education showing a marked decline, and a corresponding increase in the number of college graduates. In every major jurisdiction of the WMA more than half of the population 25 or over had completed some high school and more than a third had completed at least some college.



VICINITY MAP
GREENBELT PARK
MARYLAND

UNITED STATES DEPARTMENT OF THE INTERIOR / NATIONAL PARK SERVICE

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DSC	JUNE '80

Income

The Washington Metropolitan Area high educational levels are reflected in the correspondingly high income levels, placing the WMA among the highest in the nation in median family income. Between 1960 and 1970 median family income increased by $5,351, from $7,577 to $12,928, an increase of 70 percent. With adjustments for inflation, real income gain was about $3,500 or approximately 45 percent, but still a substantial increase.

This increase in income has continued into the 1970s. In 1974 the median family income stood at an estimated $16,000 annually, compared with a 1970 figure less than $13,000. This represents an increase in income for a considerable portion of the area's population. There were also significant gains in the number of families with income of $25,000 and above. In 1970 one WMA family in nine had an income of $25,000 or more compared with the 1974 increase of one in five. The 1977 median family income for the Washington Metropolitan Area was $22,366 (Census Bureau, 1979).

The distribution of income among WMA jurisdiction varies considerable. In 1974 the District of Columbia had the area's lowest median family income of $10,800 with 46.8 percent of the District population have median family income below $12,000 compared with 27.1 percent of the WMA population with median family incomes below $12,000. Montgomery County had the highest median family income of $21,400 in 1974, and Fairfax followed with $21,100. The 1974 median was $16,000 in Arlington County, $15,400 in Prince Georges County, and $14,100 in Alexandria.

Occupations

The only occupations within the WMA that registered gains between 1970 and 1974 were professional and managerial jobs (up 2.8% yearly) and craftsmen and foremen (up 4.6% yearly). All other occupational categories declined on number. If trends continue, there will be an increasing preponderance of professional and managerial employees and a concurrent decrease among persons in the various "support" occupations.

Age

There was a marked shift in the age structure of metropolitan Washington's population between 1970 and 1974. Young children decreased in number area-wide, as did adults from 45 to 54 years. Older children, teenagers and adults of all other ages increased. The largest gain, both in rate and in numbers, occurred among young adults from 25 to 34 years old (persons born between 1940 and 1949).

Sex

There continues to be a slight predominance of females in metropolitan Washington, as there was in 1960 and 1970. However, the gap between the sexes, which increased during the 1960s, has not grown further since the 1970 Census was taken. In October 1974, as well as in April 1970, females comprised 51.6 percent of all area residents.

COUNTY

Between 1970 and 1978, trends in the demography of Prince George's County have been fairly consistent with trends of the Washington Metropolitan Area. During the '70s, Prince George's at first grew rapidly and then lost population. The county's 1970 population stood at 663,000, rose to a high of 693,000 in 1972 and fell to 662,000 in 1978. A county projection for 1980 is 672,500.

While county population was declining, however, the number of households increased from 192,000 to 223,000. However, average household size shrank from 3.4 to 2.9 people, as the population aged and single-member households increased. Population of the county has increased during this time (up approximately 18,000) although the rate of increase has been declining since 1972 (Population Density Map, page 53). This is in keeping with trends for the entire WMA that indicates that the area will continue to grow, yet at a slower rate than has occurred in the past. Prince Georges County continues to represent approximately 22% of the total population of the metropolitan area - the largest percentage of any of the suburban political jurisdictions. The following population projections for the county have been prepared by the Metropolitan Washington Council of Governments (COG).

1980 - 673,000
1985 - 715,000
1990 - 780,000
1995 - 822,000
2000 - 871,000

Racial Group Population Characteristics

Approximately 19-20 percent of the counties population is nonwhite. The percentage is expected to increase to approximately 25 percent by 1990. This increase is partially reflective of the outmigration of nonwhites from the District of Columbia many of whom apparently migrate into Prince George's and Montgomery Counties.

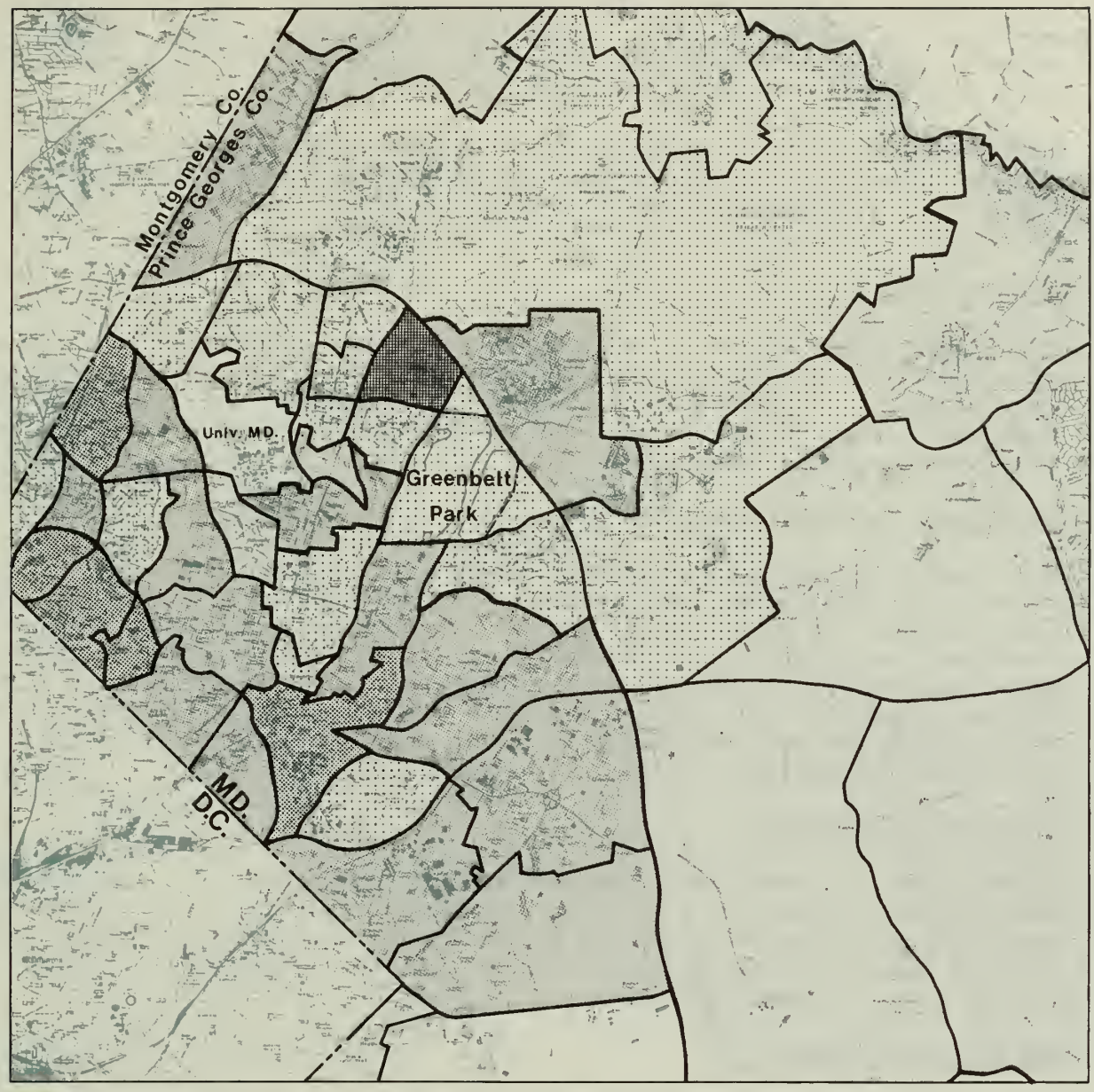
County experts point to two main population trends in Prince George during the decade of the '70s; the flight of white families seeking to avoid school busing and a major in-migration of black families. These trends have helped change the county from 15 percent nonwhite in 1970 to 30 percent nonwhite in 1977.

Housing Characteristics

Since 1970, the County's housing stock has increased only 15%, compared to the 100% increase during the 1960s. Nevertheless, the County still has more housing units than any other suburban jurisdiction in the region.

Prince George's County exceeds all other suburban jurisdictions in the supply of subsidized housing. The County housing stock consists almost totally of single-family units and garden apartments. Only 10% are in other housing types (i.e., large scale buildings of 50 units or more and 2-4 unit buildings).

It is estimated that house values increased 70% between 1970 and 1975, with the median value increasing from approximately $24,000 to $41,000. Despite



PEOPLE PER ACRE

0 - 10 | 11 - 20 | 21 - 30 | 31 - 40 | 41 - 50

1 0 1 2 3 MILES

1 0 1 2 3 4 5 KILOMETERS

N

POPULATION DENSITY GREENBELT PARK MARYLAND

UNITED STATES DEPARTMENT OF THE INTERIOR / NATIONAL PARK SERVICE

843 | 40,038
DSC | JUNE '80

the increases in house values, the County's median house value is the second lowest in the region. In 1978, the average sale price of a home in Prince George's was $54,000 compared to $78,500 in Montgomery, $72,400 in the District and $68,200 in Fairfax County.

There is a noticeable trend toward small (1- and 2- person) households which will undoubtedly affect the housing market. However, greatly increased demand for rental housing will not necessarily occur, because households are making more and more unconventional living choices.

Age Characteristics

The largest proportion of the counties population is presently in the younger age groups less than 30 years, with the greatest proportion in the 15-19 year category. The highest proportion of the state and county population is expected to remain in the younger age categories in the near future (Population Distribution by Age, pages 55 and 56).

Educational Characteristics

Past studies of recreational users indicate that recreational usage is directly proportional with educational level of the main wage earner. Given this premise, residents of Prince George's County tend to be large consumers of recreational resources. A 1975 study "Survey of Use of Parks, Recreation and Open Space" in Prince George's County indicates that nearly 50 percent of the heads of households were college graduates while less than 10 percent of heads of households had not completed high school (Institute of Urban Studies, University of Maryland, 1975).

Income Characteristics

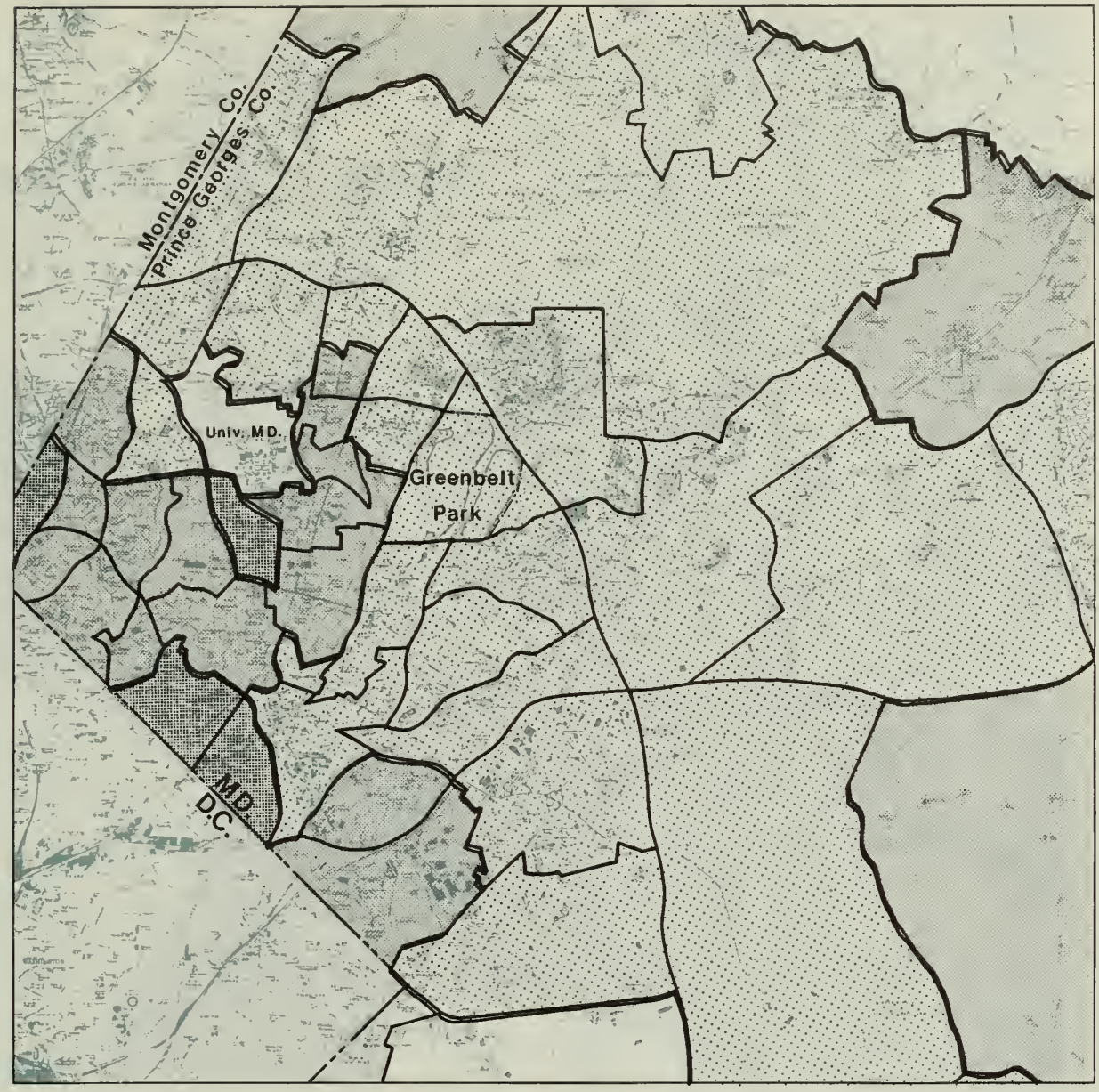
The Washington suburban areas have the highest incomes in the state of Maryland, however, incomes of Prince George's County are below those of Montgomery County, Maryland and Arlington and Fairfax Counties, Virginia. Between 1970 and 1978 near income per household reached $23,398, a 67 percent increase (Median Family Income, page 57).

Sex Characteristics

As with the Washington Metropolitan Area, females slightly outnumber males in the county (approximately 51% vs. 49%). This disparity is expected to stabilize or increase slightly by 1990.

Transportation Systems

Most of the movement of people and goods within Prince George's County takes place over its highway network. The highway network serves not only the residents of the County but also serves commuters from outside of the County to jobs inside the County and the District of Columbia. Prince George's County is also a major route for the movement of goods both into and out of the Washington Metropolitan Region. The I-95/Route 1/Baltimore-Washington Parkway corridor is a major portion of the northeast transportation corridor which extends from Boston to Washington. The amount of traffic on Prince George's County's highways is not, therefore, a function solely of the development within the County.



PERCENTAGE OVER 65 YR.

1-5 %

6-10 %

11% +

POPULATION DISTRIBUTION BY AGE GREENBELT PARK MARYLAND

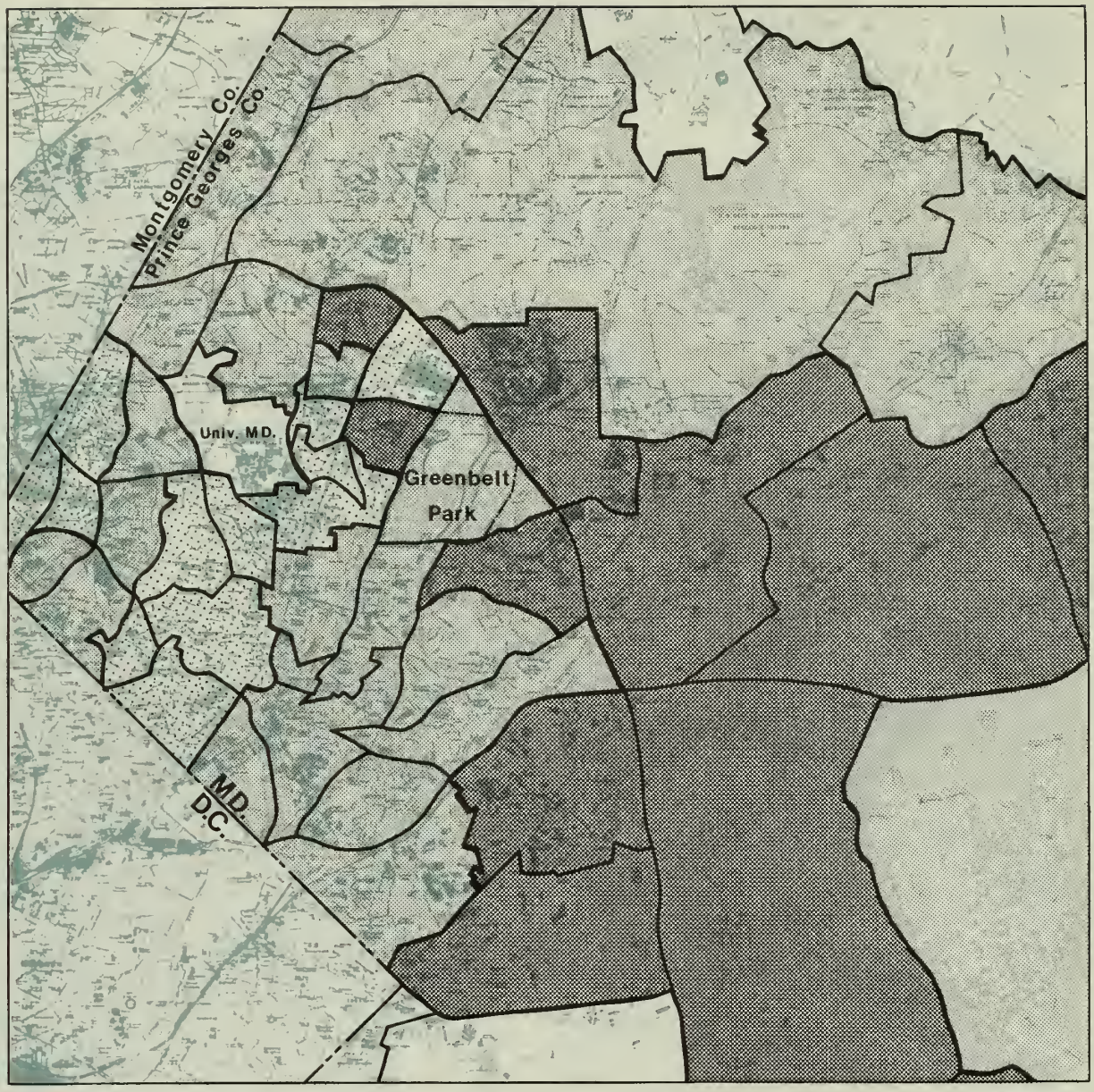
N

1 0 1 2 3 MILES

1 0 1 2 3 4 5 KILOMETERS

UNITED STATES DEPARTMENT OF THE INTERIOR / NATIONAL PARK SERVICE

843 | 40,041
DSC | JUNE '80



PERCENTAGE UNDER 18 YR.

20 - 30%

31 - 40%

41 - 50%+

POPULATION DISTRIBUTION BY AGE GREENBELT PARK MARYLAND

N

1 0 1 2 3 MILES

1 0 1 2 3 4 5 KILOMETERS

UNITED STATES DEPARTMENT OF THE INTERIOR / NATIONAL PARK SERVICE

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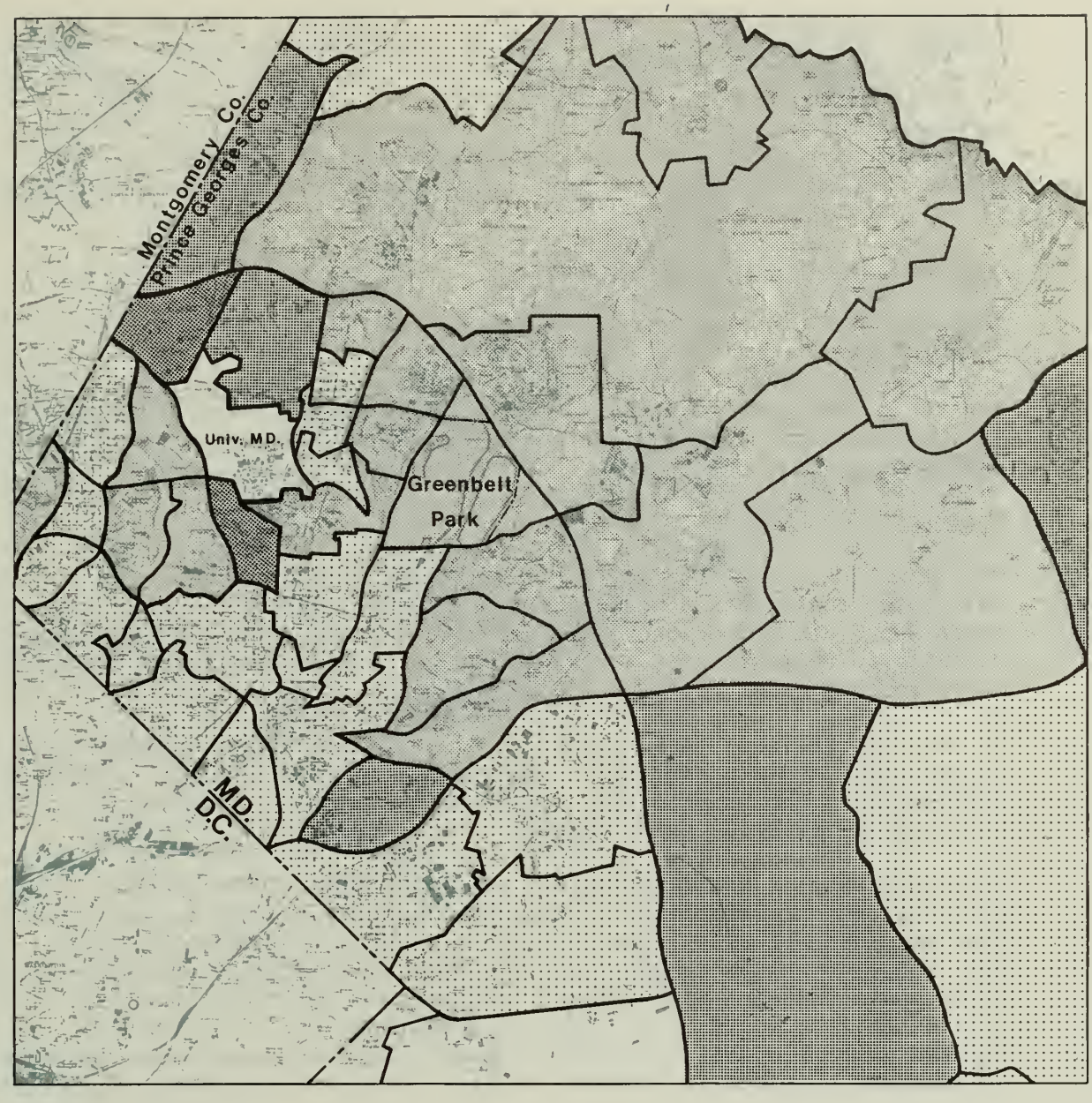
DSC | JUNE '80



DOLLARS PER ANNUM

Under 11,999

12,000 – 14,999

15,000 – 17,999

Over 18,000

1 0 1 2 3 MILES

1 0 1 2 3 4 5 KILOMETERS

N

MEDIAN FAMILY INCOME GREENBELT PARK MARYLAND

UNITED STATES DEPARTMENT OF THE INTERIOR / NATIONAL PARK SERVICE

843 | 40,037
DSC | JUNE '80

Existing highways are laid out in what is essentially both a radial and circumferential manner. Radial routes provide access to and from areas such as the District of Columbia, Baltimore, Annapolis, and Charles City, in addition to their intra-County service role. Circumferential routes provide access around the County and to such areas as Virginia and Montgomery County. With several exceptions, the major roads in the County are either Federal or State routes and are, therefore, maintained by the State of Maryland (Regional Travel Time, page 59).

Mass Transit in the Washington Area

The provision of mass transit in the Washington Metropolitan Area is the responsibility of the Washington Area Transit Authority (WMATA). WMATA is a public agency established through a Congressionally-approved interstate compact and run by elected officials and their appointees from Maryland, Virginia and the District of Columbia. Currently WMATA operates the Metrorail and Metrobus System.

Metrorail

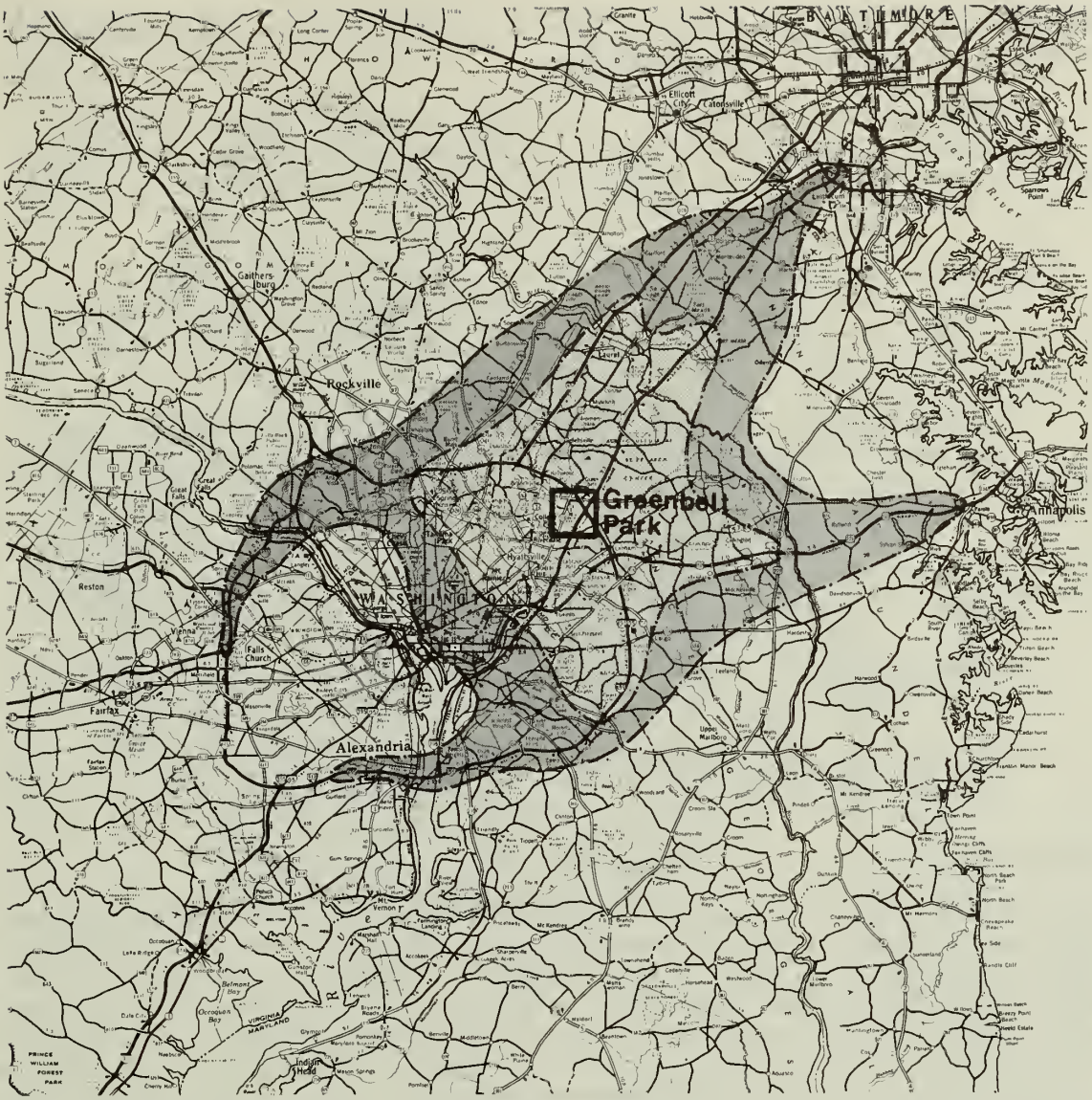
The Adopted Regional System (ARS) was the "final" route plan for Metro rapid rail which construction would follow. ARS was adopted in March 1968 by the WMATA Board and authorized by Congress in December 1969. It was revised slightly in February 1969 and June 1970 and further revisions are certain prior to completion of the system.

At present, the ARS system consists of 99.7 route miles, of which 48.3 are to be subway and 51.4 surface. The District of Columbia has 38.3 route miles, Virginia 29.4 and Maryland 32.0. Of the Maryland portion, some 13.6 miles would be in Prince George's County.

Under ARS, four routes extend into Prince George's County. The first of these would extend through Chillum, Prince George's Plaza, College Park and terminate at Greenbelt Road. The second passes through Deanewood, Cheverly, Landover and ends at New Carrollton. The next line passes through Capital Heights and stops at Addison Road in Seat Pleasant. This line is under construction. The fourth line would be to Branch Avenue, stopping at Naylor Road and Suitland. The ARS system is entirely within the Beltway and is dependent upon bus service to terminal stations in order to be utilized by the entire County.

Upon completion of the entire system, it would be possible for Prince George's County residents to travel not only to the District of Columbia, but also to a wide range of points within the Metropolitan area, as far as Vienna, Virginia. It should be noted, however, that all intra-County passenger movement must be radial and that lateral movement must come from other transportation sources.

Various segments of the ARS system have been under construction since 1969. In 1976, the first part of the system running from Rhode Island Avenue to Farragut North was opened for public use. Shortly thereafter, an additional segment from Farragut North to Dupont Circle was opened. In the summer of 1977, a route from Stadium-Armory through downtown Washington, Rosslyn, Virginia, and the Pentagon area to National Airport was opened. By 1978, an additional part of the Glenmont line from Rhode Island to Silver Spring was completed.



Travel time by automobile

15 MINUTES

30 MINUTES

REGIONAL TRAVEL TIME

40,034

The Greenbelt ("E") Route Alternatives Analysis Study is considering six possible alternative alignments.

1. ARS Modified Alignment - Greenbelt Terminus. This alignment would substitute a station at West Hyattsville for the Chillum station. It would consider an "S" curve between the D.C. line and Prince George's Plaza.

2. Western Alignment - I95 Terminal. The alignment would run along the west side of the University of Maryland instead of along the east side. It would have a station at West Hyattsville instead of Chillum.

3. ARS Modified Alignment - Prince George's Plaza Terminus. This alignment would stop at West Hyattsville and terminate at Prince George's Plaza. The "S" curve alignment south of Prince George's Plaza is also being reviewed.

4. ARS Modified Alignment - Fort Totten Terminus. Rapid rail would not enter Prince George's County on the "E" route.

5. ARS Modified Alignment - Columbia Heights Terminus. Rapid rail would not enter Prince George's County.

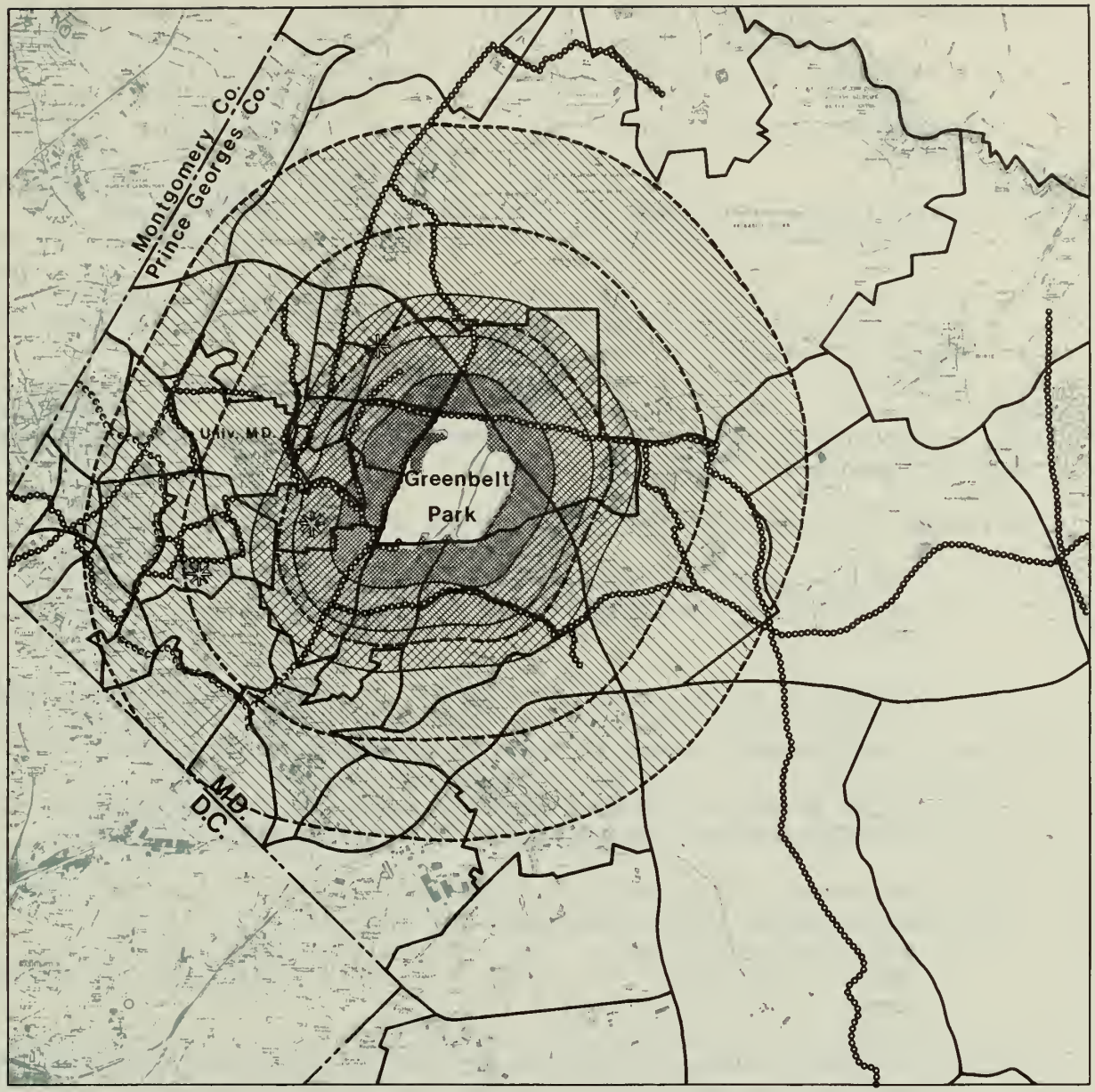
6. Gallery Place Terminus. No northern alignment would be undertaken on the "E" route.

Bus Service

Bus service in Prince George's County is concentrated within the Beltway, with the northern urbanized area receiving the most service. The areas close to the Beltway which are served are: Beltsville, Greenbelt, Glenn Dale, Andrews Air Force Base, Camp Springs and Oxon Hill. The outlying areas served are: Indian Head Highway extended, Central Avenue extended, Bowie-Belair, and Huntington. Virtually all lines extend from the District of Columbia, generally in the northern, central and southern corridor pattern rather than cross-county. As various segments of metrorail are completed, the bus service will be structured to feed into Metro stations.

Bikeways

Prince George's County presently has a small trail system which ranges from a small bike trail in the southern part of the County to a hiker, biker and horse trail through Riverdale. A plan has been completed for a far more extensive system which would provide access to the University of Maryland, Prince George's Community College, schools parks, libraries, employment areas, recreation centers, commercial areas, future Metro stations and other points of interest (Hiking/Biking Travel, page 61).



TRAVEL TIME

WALKING	BIKING
10 MIN.	10 MIN.
20 MIN.	20 MIN.
30 MIN.	30 MIN.

BIKE/HIKING TRAIL

EQUESTRIAN TRAIL

PROPOSED METRO STATION

1 0 1 2 3 MILES

1 0 1 2 3 4 5 KILOMETERS

N

HIKING/ BIKING TRAVEL GREENBELT PARK

MARYLAND

UNITED STATES DEPARTMENT OF THE INTERIOR / NATIONAL PARK SERVICE

843 | 40,036
DSC | JUNE '80

There are four types of hiking trails:

Primitive trails -- Unmaintained but passable through use

Maintained trails -- Marked with signs and maintained clear of obstacles

Nature trails -- Planned and laid out to be instructional and informative

Trail for the blind -- Designed, located, and maintained in such a way as to facilitate use by blind individuals to feel and sense the characteristics of the environment

There are eight areas in the County where hiking trails have been established. They are located on parklands owned by County, State, and Federal agencies and often maintained with help from volunteers.

The Maryland-National Capital Park and Planning Commission manages:

1. Robert M. Watkins Regional Park: Three miles of hiking trails presently exist, and a one-half-mile nature trail is under construction.

2. Northwest Branch Park: Six miles of primitive hiking trail lead to Montgomery County and continue through the stream valley. This trail is maintained, in part, by Boy Scout volunteer service.

3. Paint Branch Park: Four miles of primitive trail wind along Paint Branch from Northeast Branch to Cherry Hill Recreation Center.

4. Northeast Branch Park: Three miles of primitive trail lead to Paint Branch and Indian Creek.

5. Indian Creek Park: Two miles of primitive trail run from Northeast Branch to Greenbelt Road.

6. Louise F. Cosca Regional Park: Four miles of primitive trail and one and one-half miles of nature trail exist, the latter being maintained by M-NCPPC.

7. Aquasco Farm: Six miles of wood-edged trails are maintained with volunteer help from the Girl Scouts.

8. Mt. Calvert Regional Park and Nature Center: There are one-half mile of boardwalk, one mile of nature trail, four miles of primitive trails, and a 1,200-foot trail for the blind (maintained by M-NCPPC).

The National Park Service manages:

1. Greenbelt Park: Twelve miles of trails are maintained by the National Park Service.

2. Fort Washington Military Historical Park: Two-mile tours of the site

are conducted by the National Park Service along a hiking and biking trail, maintained by the National Park Service.

The State of Maryland manages:

Cedarville State Forest and Park: Fourteen miles of marked trails are maintained by the State of Maryland.

Several bikeways are also found in the County. These are classified as classes:

I. Exclusive bikeway with separate right-of-way.

II. Hiker - biker trail on sidewalk with a striped right-of-way.

II. Exclusive bicycle lane on the street and protected by a physical barrier.

II. Exclusive bicycle lane on the street and designated only by pavement stenciling and striping.

III. Shared bicycle route designated only by signals and carrying mixed traffic.

These include:

1. Trail 1A: Northeast Branch Park, Class I, Hiker-Biker, Equestrian, Recreation, and Commuter Trail. 5 miles -- From Trail 2A north along Northeast Branch to Paint Branch Spur: Class II Bikeway along Riverdale Road to Riverdale commuter rail stop and Trail 6.

   Function: Access to University of Maryland future Metro transit station, and shopping and employment areas. Possible links to Metro stations and commuter rail stops at Riverdale Road and Calvert Road.

   Project Status: The completed portion of the trail begins at Tanglewood Drive, 1,400 feet north of Decatur Street. It follows Tanglewood Drive to Riverdale Road, crosses Northeast Branch, and continues north through the Riverdale Recreation Center to Paint Branch in the vicinity of its confluence with Indian Creek. This trail, comprising a total of 4 miles is the longest trail in the County.

2. Trail 1B: Paint Branch,Class II Bikeway,Recreational and Commuter Trail. 3.6 miles -- From Trail 1A north along Paint Branch to Cherry Hill Recreation Center.

   First Section: Cherry Hill Road to Metzerott Road.
   Second Section: Into University of Maryland via levee along west side of Paint Branch.

   Function: Part of the primary system of trails linking a population center with the University of Maryland and other areas of interest in College Park. Reviewed and recommended by State Department of

Transportation as part of University of Maryland access study.

Project Status: Preliminary design is contingent upon negotiating right-of-way easements, land acquisition, and a Route 1 crossing.

3. Trail 1C: Berwyn Road, Class III Bikeway, Commuter Trail. 2 miles -- From Indian Creek Trail III west on Berwyn Road to 54th Avenue, to Lakeland Road, to Baltimore Avenue (Route 1) and to Paint Branch Trail 1B.

   Function: A tributary route as an alternative route from Greenbelt to University of Maryland. Link to Berwyn commuter rail stop.

   Project Construction: Prince George's County Department of Public Works and Transportation.

   Project Status: This Class III Bikeway is along existing roads within the Town of Berwyn Heights. Signing can be installed with the consent of the Town.

4. Trail 1D: Kenilworth Avenue (Route 201), Class II Bikeway, Commuter Trail. 8 miles -- Along Route 201 and Powder Mill Road to Route 1 (Baltimore Avenue) near Beltsville and south to Calvert Road and Northeast Branch Trail.

   Function: A primary route from the Northeast Branch Trail to Greenbelt, Beltsville, and the Beltsville Agricultural Research Center.

   Project Status: The section from the Capital Beltway south to Calvert Road has recently been improved with adequate shoulders. Signing and stiping can be installed with the consent of the State.

5. Trail 1E: Greenbelt Road, Route 193, Class I Bikeway, Commuter Trail. 3.6 miles -- From Indian Creek to Goddard Space Flight Center, National Aeronautics and Space Administration (NASAH.

   Function: As part of the primary system linking NASA to residential areas.

   Project Status: A 1.5 mile bikeway between Lakecrest Drive in Greenbelt and 57th Avenue in Berwyn Heights is scheduled for completion in Spring 1976. This is one of the two demonstration bikeways to be constructed by the State Highway Administration of the Maryland State Department of Transportation.

6. Trail 1F: Greenbelt Park, Classes II and III Bikeway, Recreational and Commuter Trail. ½ mile -- From Northeast Branch Trail to Greenbelt Park, via street and existing dirt trail in park.

Function: To serve as a tributary trail to the high school; also as a recreational trail to and in Greenbelt Park. To connect with bus routes.

Project Status: Preliminary design and signing will be initiated, pending availability of funds

7. Trail 1G: Indian Creek, Class II, Hiker-Biker, Commuter, and Recreational Trail. 1.8 miles -- From the confluence of Paint Branch north to Springhill Lake Apartments. Spur: Class II Bikeway between Indian Creek and Radcliffe Drive to tie in with Knoxville Drive in College Park Estates.

   Function: Commuter and recreational trail to the University of Maryland, shopping areas, and intercommunity travel.

   Project Status: A portion of this 1.8 mile project was completed in 1976, in conjunction with the Washington Suburban Sanitary Commission Indian Creek Relief Sewer Project. A 500-foot spur of Trail 1G will link subdivision streets in College Park Estates and Yarrow Estates.

8. Trail 2A: Northwest Branch Park, Class II Hiker-Biker, Commuter, Recreation, and Equestrian Trail. 6 miles -- From Peace Cross north to Montgomery County line. Spur: Class I Bikeway along University Boulevard to the UMCP (University of Maryland-College Park) trail, Campus Drive West. To be built in two sections:

   a. From Ager Road to Riggs Road.
   b. Ager Road south to Peace Cross; Riggs Road north to Montgomery County line.

   Function: Commuter route to University of Maryland, recreation, shopping, and intercommunity travel. Links to future Metro stops and bus lines.

   Project Status: A 0.75-mile segment from Riggs Road north to the Montgomery County line is complete.

9. Trail 2B: Adelphi Road, Class II Bikeway, Commuter Trail. 1.4 miles -- From north of Metzerott Road south to University Boulevard (Route 193), via shoulders of the road, with access to the PEPCO power line trail.

   Function: Tributary to University of Maryland and Northwest Branch Trail. Link to proposed Metro transit station.

   Project Status: Preliminary design will begin when funds are available.

10. Trail 2C: Metzerott Road, Class II Bikeway, Commuter Trail. 1.6 miles - From Adelphi Road to Azalea Road, via shoulders of the road.

Function: Tributary to the University of Maryland and Northwest Branch Trail. Link to proposed Metro transit station.

Project Status: This bikeway is on four-foot-wide paved shoulders.

11. Trail 2D: Buck Lodge Road-PEPCO Power Line, Classes I and II Bikeway, Equestrian and Commuter Trail. 2.0 miles --From Buck Lodge Road, a Class I bikeway, along the Buck Lodge Junior High School service road, across the I-95 right-of-way to the PEPCO power lines, and then along the power lines to Adelphi Road, Class II from the power lines south of Adelphi Road to Adelphi Plaza.

    Function: A tributary route to the University of Maryland, Buck Lodge Junior High School, and a shopping center. Possible link to proposed Metro transit stations.

    Project Status: Preliminary design will be initiated when funds are available. Actual construction of a bicycle and equestrian trail will begin when negotiations for use of the power line right-of-way are completed.

12. Trail 2E: Prince George's Plaza 1, Classes I, II, and III Bikeway, Commuter and Recreational Trail. There are two routes from Prince George's Plaza to Northwest Branch (Trail 2A).

    a. 1 mile -- Classes I and III Bikeway from Prince George's Plaza to Northwest Branch Trail via Dean Drive and Northwest Drive over existing park bridge to west bank and Trail 2A.

    b. 1 mile -- Class II Bikeway from Prince George's Plaza to Northwest Branch Trail via East-West Highway Maryland Route 410).

    Function: A tributary to the Northwest Branch Trail and to the Prince George's Plaza Shopping Center and Office Complex. Link to proposed Metro transit station and bus routes.

    Project Status: Construction of this project will be dependent upon the construction of Northwest Branch Trail 2A.

13. Trail 2F: Prince George's Plaza, Classes I,II,and III Bikeway Commuter Trail. 2 miles -- From Trail 2E along Dean Drive, via University Park residential streets, to Knox Road and University of Maryland. A bike route (of the classes indicated) could be provided along the following streets, roads, and parkway.

    a. Along Dean Drive and Calverton Drive, from Northwest Drive to Wells Parkway -- A Class II bike route along both sides using the sidewalks.

    b. Wells Parkway, from Toledo Road to Chancery Lane -- A Class II bike route along both sides, using the existing sidewalks.

c. Chancery Lane and Calverton Drive, from Wells Parkway to the Washington Suburban Sanitary Commission easement -- A Class III bike route along both sides.

d. Washington Suburban Sanitary Commission right-of-way, from Calverton Road to Knox Road -- A Class I bike route.

e. Toledo Road from Prince George's Plaza to Wells Parkway -- A Class III bike route.

There are several difficulties associated with this route because of long, steep grades on Chancery Lane and Calverton Drive, a bike crossing at Adelphi Road, and pedestrians along Toledo Raod. Because of its many inherent advantages and because of the level of service, this route could provide a bikeway through University Park. The residential area is considered most approporiate by comparison with other alternatives.

Function: Tributary to University of Maryland, Prince George's Plaza, office complex, and residential area, serving the University community with access to shopping and employment areas, a future Metro transit station, and a library.

Project Status: Preliminary design will begin when funds are available.

14. Trail 2G: Sligo Creek Parkway, Class II Bikeway, Recreational and Commuter Trail. 2.4 miles -- From Northwest Branch to Montgomery County line. This route will lead to Wheaton Regional Park in Montgomery County. Links to future Metro transit stations, bus stops, and a commuter rail stop.

Project Status: Prelimary drawings have been completed.

15. Trail 5A: South Laurel, Classes II and III Hiker-Biker, Commuter and Recreational Trail.

Length of Project: 6 miles -- To follow South Laurel Master Plan and to add the following:

a. From: Route 197
To: Brock Bridge (Class II)
Via: Brock Bridge Road

b. From: Old Muirkirk Road (Class III) at Muirkirk Road
To: Rhode Island Avenue Trail
Via: Muirkirk Road shoulder

c. From: Muirkirk Road (Class II)
To: NASA
Via: Odell Road to Springfield Road, to Powder Mill Road under the Baltimore-Washington Parkway, to Soil Conservation Service Road, and to Greenbelt Road.

d. From: Muirkirk Road (Class II)
To: Briarwood Road
Via: Route 197

Function: To serve as a commuter and recreational trail around South Laurel and to connect this area with the primary trail system. Link to bus and commuter rail systems.

Project Status: Preliminary design will begin when funds are available. The segment of Trail 5A located within the Beltsville Agricultural Research Center is recommended for Class III Bikeway along existing roads. Signing and striping along the road shoulders can be provided with the cooperation of the Prince George's County Department of Public Works and Transportation and the Beltsville Agricultural Research Center authorities.

16. Trail 5B: Agricultural Center Roads, Class Bikeway, Commuter and Recreational Trail. 20-plus miles -- A loop which includes Powder Mill Road, Beaverdam Road, and Springfield Road east of Kenilworth Avenue and various other roads in the Beltsville Agricultural Research Center.

Function: To provide access to the Agricultural Research Center and to serve as a recreational area for cyclists.

Project Status: Signing and striping can be provided along existing roads inside the Beltsville Agricultural Research Center with the cooperation of the Prince George's County Department of Public Works and Transportation and the Beltsville Agricultural Research Center authorities.

17. Trail 6: Rhode Island Avenue Trolley Line, Class II Hiker-Biker Trail. 11 miles -- From Riverdale commuter rail stop at Queensbury Road to South Laurel trail system, 5A, at Muirkirk Road.

Function: To provide convenient commuter access to the University of Maryland area from the north and south and to provide a recreational trail. Links with the commuter rail stops in Riverdale, College Park, Beltsville, and South Laurel.

Project Status: The document, "Initial Assessment of Acquisition of the Rhode Island Avenue Trolley Right-of-Way Between Queensbury Road and Berwyn Road," by ;the Maryland Department of Transportation has been completed. Title search information on the properties comprising that portion of the right-of-way has also been completed. Pending resolution of an acquisition issue, it is intended that con struction begin between the Rossborough Lane bikeway (University of

Maryland campus trail) and Lakeland Road. This 0.4 mile trail, along the abandoned trolley line, will link the University of Maryland campus bikeway system to the Berwyn Road Trail 1C, the Indian Creek Trail 1G, and the Northeast Branch Trail 1A.

Source: Adopted and Approved Countywide Trails Plan. The Maryland-National Capital Park and Planning Commission. 1975.

Conrail

Conrail is the new Federal government sponsored merger of non-passenger train service throughout the County. Conrail operates freight service on one line in the County. This line is located along the old Penn Central Main Line of the Pennsylvania Railroad which was used when by law that railroad was denied service to Washington. It now functions as a spur track off the Amtrak line in the Bowie area and extends to Pope's Creek in Charles County with a second spur to the Chalk Point power plant. Thus almost all of its business is to the power plant.

Public Facilities

Water Supply Facilities. The Washington Suburban Sanitary Commission (WSSC) is charged with the responsibility of providing and operating community water systems for much of Prince George's County. Existing water and sewer lines in the County are generally concentrated inside the Capital Beltway, with major extensions in the vicinity of Indian Head Highway, Branch Avenue, Landover Road, Lanham-Severn Road, Annapolis Road, and in the U.S. Route 1 and Interstate 95 corridor.

Two major water filtration plants are operated by the WSSC:

1. Potomac Filtration Plant: 240 mgd rated capacity treatment plant in Montgomery County, and

2. Patuxent Filtration Plant: a 67 mgd rated capacity treatment plant in Prince George's County, near the City of Laurel. Filter backwash requires a 2 mgd; therefore, the normal capacity is 65 mgd.

Sewerage Facilities. Presently, Prince George's County is served by six major sewage treatment plants. Five of them are operated by the WSSC and one by the City of Bowie. For many of these basins, the County Council has adopted policies which allocate the relative amounts of the plants' capacities that can be used by residential or commercial-industrial users.

It is unlikely that the Blue Plains plant will be expanded be yond what is presently being constructed due to the water quality of the reach of the Potomac into which it discharges. The Piscataway plant will, by the mid-1980's, handle overflow from the Blue Plains Plant.

Solid Waste Facilities. The County is involved in two phases of solid waste management - collection and disposal. Collection is conducted through combined public and private activities. Disposal is carried out, for the most part,

through the use of land disposal techniques, e.g., rubblefills and sanitary landfills. Four sanitary landfills are currently operational in the County. The College Park, Laurel, and Belair landfills serve much of the population in the northern area, while the Brown Station Road landfill accepts most of the remaining solid wastes.

Three of the sanitary landfills in the County (College Park, Laurel, and Belair) have ceased operations. In response to the solid waste disposal needs that will be present in the northern part of the County at the time, the County is taking steps that will allow the development of a "creative disposal project" on a 211-acre tract of land northwest of Bowie. This program, which will be designed and operated by a private management firm (at its expense), will enable the County to utilize a temporary landfilling operation to create a permanent scenic and recreational assest.

Stormwater Facilities. The WSSC is authorized, under the provisions of the Washington Suburban Sanitary Code, to plan, design, construct, maintain and operate storm and surface water drainage systems in the County. The current storm drainage program has been in operation since 1941, with approximately 442 projects completed throughout the County.

The major agencies in the County which deal with programs related to stormwater management in the one form or other include the Washington Suburban Sanitary Commission, Maryland-National Capital Park and Planning Commission, Department of Public Works and Transportation, Department of Licenses and Permits, Soil Conservation Service and Department of Program Planning and Economic Development. These programs have operated for several years without definitive overall policy guidance. Efforts are being made to resolve these issues so as to develop a comprehensive approach to stormwater management in the County.

Public Safety Facilities

Police Facilities. Police Facilities include a headquarters and police academy building in Forestville, and five district stations located in Hyattsville, Bowie, Seat Pleasant, Oxon Hill, and Clinton. There are three field offices housing specialized activities in Forestville and Suitland.

Detention Facilities. The Sheriff's Department, headquartered in Upper Marlboro, operates the County Detention Center in Upper Marlboro, and a Female Detention Center in Hyattsville. In addition, the Department operates two field offices and two support facilities.

Fire Fighting Facilities. Prince George's County is served by 49 fire stations and combined fire and rescue stations located throughout the County. These facilities are operated by the Fire Department, with major support from the career and volunteer fire services. The Department also has two administrative locations in Hyattsville. In general, the coverage of the County by existing fire and rescue stations is adequate except in some isolated rural areas. There are a few developing areas which require the construction of new stations, while some older areas have need for additions to, or replacement of, existing stations.

Existing Hospital Facilities

The County currently operates one hospital, the Prince George's General Hospital and Medical Center. There are three private general hospitals open to the general public: Clinton Community Hospital, Doctor's Hospital in Lanham, and Eugene Memorial Hospital. In addition, some County residents utilize nearby facilities such as the Southeast Community Hospital, Holy Cross Hospital, Adventist Hospital, Washington Hospital Center, and Physicians Memorial Hospital in LaPlata. Military hospital facilities such as the Malcolm Grow Memorial Hospital at Andrews Air Force Base provide general hospital care for armed forces personnel and their dependents.

The County is continuing to expand the General Hospital at Cheverly, the largest and most specialized hospital in the County. A second County general hospital is under construction at Laurel, and a third is programmed for the Bowie area. A private general hospital is currently under construction in the southern area of the County.

Public Elementary and Secondary Schools

The Prince George's County Public School System includes 161 elementary schools, 41 junior high schools, 19 senior high schools, 9 special education centers, 2 evening high schools, 2 vocational centers, and an adult education center. The school system includes facilities of widely varying age, although a large proportion of the schools were built during the rapid growth period of the 1960's. In recent years, the emphasis of the Capital Improvement Program has been on renovating older schools to bring them up to contemporary educational and building standards.

Community College Facilities

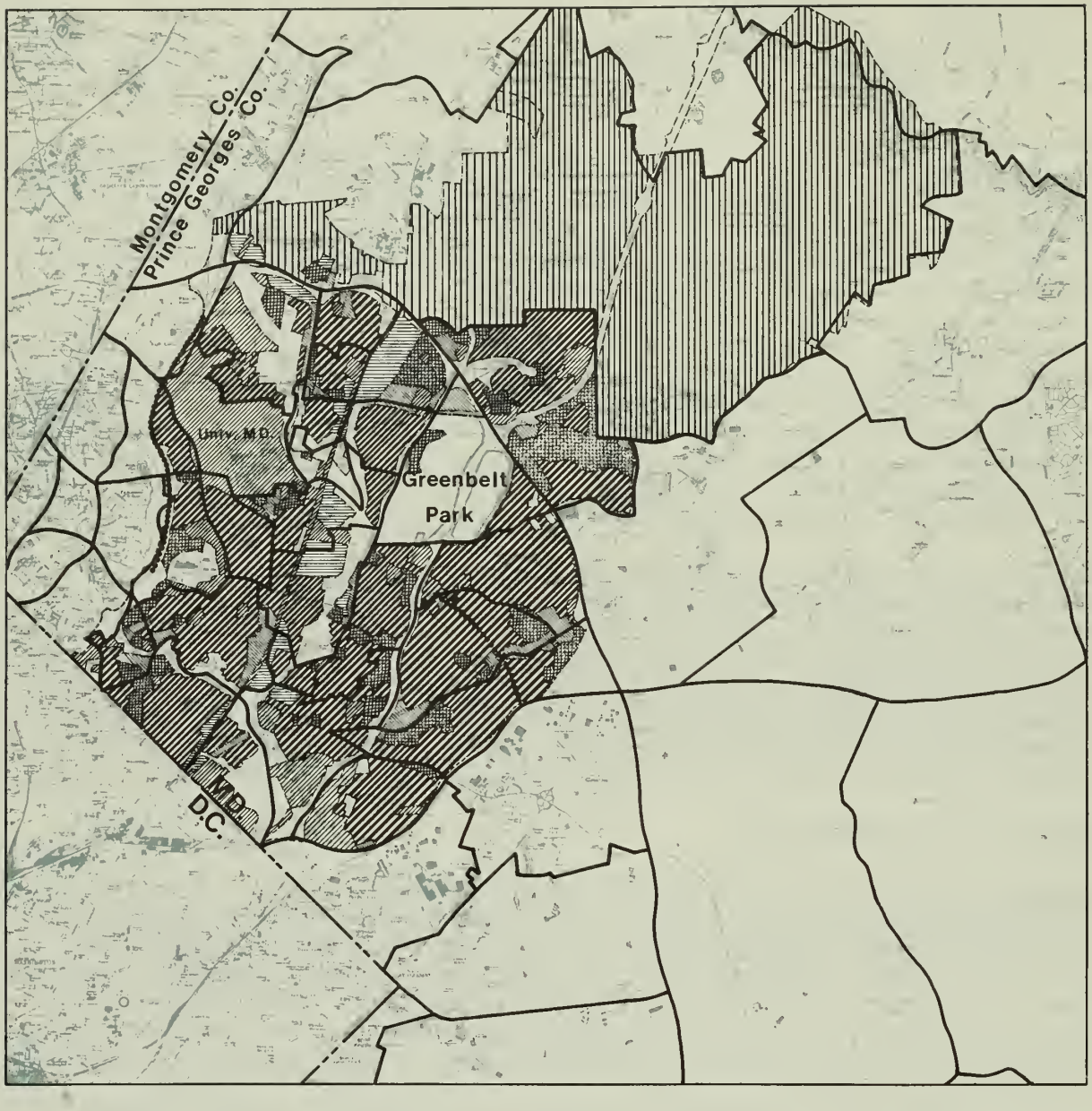
The Prince George's Community College presently has one campus, 150-acre facility located in Largo. This campus has 300,000 square feet of instructional space and auxiliary facilities and is presently 75 percent complete. Additional capital improvements programmed for this location include a learning resources center, additions to the science and physical education buildings, parking and roadway improvements, and a nursing education building. The Community College also offers non-credit courses at numerous off-campus locations.

The current enrollment in credit courses is approximately 12,000 with nearly 5,000 full-time day students.

General Governmental Facilities

The major administrative facilities of the County are the Courthouse and new County Administration Building in Upper Marlboro, and the County Service Building in Hyattsville.

Central Service operates a number of support facilities, some of them in leased space. Support Facilities 1 and 2 located off U.S. 301 near Upper Marlboro with storage facilities on D'Arcy Road and on Pratt Street in Upper Marlboro. Date Processing and the computers are located in leased space in Upper Marlboro.



FEDERAL OWNERSHIP

OPEN SPACE

SINGLE FAMILY RESIDENTAL

HIGH DENSITY RESIDENTAL

EDUCATIONAL FACILITY

COMMERCIAL USE

INDUSTRIAL USE

PROPOSED ROUTE

1 0 1 2 3 MILES

1 0 1 2 3 4 5 KILOMETERS

N

LAND USE
GREENBELT PARK
MARYLAND

UNITED STATES DEPARTMENT OF THE INTERIOR / NATIONAL PARK SERVICE

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Purchasing and the 911 Center are located in County-owned space, and four vehicle maintenance and management garages are operated in leased space.

The Department of Public Works and Transportation is responsible for maintaining the Courthouse and County Service Building. The Department maintains an office and maintenance facility on D'Arcy Road.

Maintenance and support facilities are also operated by the Board of Education, the M-NCPPC, the WSSC, and other County agencies.

Land Use/Zoning

Residential Zoning. At present, some 288,850 acres have been zoned for some form of residential development in Prince George's County (excluding the City of Laurel and the Beltsville Agricultural Research Center). This is equivalent to 451 miles of residentially zoned land. Of this, 63,800 acres (100 square miles) has been developed. On the average, approximately eleven persons reside on each acre of residentially developed land. In turn, approximately 3.5 dwelling units have been constructed on each acre of residential land (Existing Land Use, page 72).

Commercial Description. The largest number of commercial concentrations in Prince George's County is within the Beltway. Major commercial areas consist of several types -- "strip" commercial development along principal thoroughfares and shopping centers or malls. In addition, there are several major non-retail commercial areas such as Bowie and Rosecroft race tracks and the tobacco auction barns of Upper Marlboro.

Commercial Zoning. At present, Prince George's County has zoned approximately 6,300 acres for commercial purposes (excluding the City of Laurel and the Beltsville Agricultural Research Center). This constitutes approximately 2 percent of the land in the County. Nearly one-quarter of all land zoned commercial (23 percent) and nearly one-third (31 percent) of all developed commercial land is in Subregion II.

It appears that most planning areas within the county have substantial commercial growth without necessitating a change in existing zoning. For example, 21 of the 36 planning areas have less than 49 percent of their zoned commercial land actually developed. All but four planning areas have less than 75% so developed. For the County as a whole, approximately 46 percent of zoned commercial land has been developed.

Developed commercial land comprises approximately 4 percent of all developed land in the County. When compared with urban areas generally, this percentage would appear to be somewhat above average. One such standard indicates that in urban areas, the proportion of developed land for commercial uses has been 2.65 percent with a range of 1.15 percent to 4.64.

Industrial Description. Approximately 7,000 acres of land in Prince George's County are zoned for industrial use. This constitutes approximately 22 percent of the County's total land area. Of this, some 3,100 acres or (42 percent) are actually developed into industrial uses (including sand and gravel operations).

In addition, approximately 1,300 acres (or 18%) has been developed into various non-industrial uses (including public and semi-public uses). Thus, of the toal amount of industrially zoned land, some 3,000 acres (or 40%) remains undeveloped. The amount of undeveloped industrially zoned land, it should be noted, is equal in quantity to the amount of land presently developed into industrial uses. However, of these 3,000 undeveloped industrial acres, approximately 1,500 acres are, in fact undevelopable due to severe soil limitations.

Institutional and Open Space. The amount and distribution of institutional properties may exercise a significant impact upon land development within a jurisdiction. First, if such holdings are large, they will force other forms of development to be located elsewhere, thereby influencing not only the form which development takes in the County, but also density pattersn. Second, such land always poses the threat of being disposed of in a manner which will be in conflict with other uses surrounding it or with the overall development plan for an area. Third, the tax-exempt status of institutional properties has the potential of creating financial problems for the County in such holdings are numerous and/or large.

At present, there are slightly over 7,000 parcels of tax-exempt land in Prince George's County. Of the slightly more than 7,000 tax-exempt parcels in Prince George's County, some 83% are small (less than five acres in size). Nearly ninety-five percent of tax-exempt parcels are 21 acres or less in size.

Since a large number of tax-exempt areas are either directly or indirectly open space uses, open space is also considered under the Institutional heading (Regional Open Space, page 14).

Open space is defined in the "Park, Recreation, and Open Space Plan" as those areas which are in a natural state or under vegetative cover. Open space is not simply vacant land or land that has not yet been developed. It may serve a number of purposes including:

1. Aesthetic relief from the pressure and environment of the city,
2. Preservation of wildlife habitat,
3. Recreation,
4. Agriculture,
5. Watershed protection,
6. Protection of important environmental features such as flood-plains and wetlands,
7. Preservation of areas of scenic and cultural value.
8. Buffering between conflicting uses,
9. Absorption of air pollution,
10. Possible repository for sewage wastes, and

11. Serving as a "landmark" for future operations such as solid waste disposal sites or the site for a new college or health center.

There are a number of forms of open space within Prince George's County. These range from large institutions to parkland to very low density residential areas. All of these serve some of the purposes listed above.

Public Parks. There are a great number of parks within Prince George's County. There are Federal parks such as Greenbelt Park and Fort Washington. The Maryland-National Capital Park and Planning Commission operates a park system that includes stream valley parks, regional parks, and smaller parks that serve smaller areas. The State of Maryland operates several facilities in the southern part of the County.

Institutions. A number of the institutional uses within the County are predominantly open space. The Beltsville Agricultural Research Center, for instance, is a major portion of the "wedge" in the northern part of the County. Other institutional uses that are predominantly open include cemeteries, Glenn Dale Hospital, and Boys Village.

Farmland. A major land use in the non-urbanized portions of the County is agricultural.

Very Low Density Residential. Open space areas can include very low density residential uses. There are three zones which set large minimum lot sizes. The R-A Zone (Residential-Agricultural) requires at least a two-acre lot and is used primarily for farms and low density single-family dwellings. The O-S Zone (Open Space) requires at least a five-acre lot and is used for low density development, as indicated on the General Plan and adopted and approved area plans, and for uses which preserve the County's ecological balance and heritage. Agricultural, natural resources uses, residential estates, and non-intensive recreational uses are allowed in this zone. The R-E zone (Residential-Estate) requires a one-acre lot and is used primarily for single-family dwellings.

Other. There are other uses which can be considered as open space. Private recreation areas such as golf courses and country clubs are predominantly open space. Other uses include power line right-of-way, state forest land, and common open space areas in subdivisions.

Parks and Recreation Facilities. The Maryland-National Capital Park and Planning Commission (M-NCPPC) is responsible for the acquisition, development, maintenance, and operation of the County's park system and recreation facilities (Park and Recreation Areas, page 78 and Appendix D).

A number of municipalities are also acquiring land and developing local parks, but these represent only a minor share of the public park system. An inventory of recreational land in Prince George's County indicates a total of approximately 8,300 acres of park, recreation, and open space lands. The Federal Government administers approximately 1,600 of the 8,300 acres representing about 11% of total parkland. Greenbelt Park is the largest single park area with over 1,000 acres.

The M-NCPPC has grouped the park and recreational lands under their jurisdiction into several major categories: local parks and recreational centers, regional parks, stream valley parks, and historical and other special parks or sites.

Local Park and Recreation Facilities. Local parks and recreation centers constitute 24 percent of the approximately 13,000 acres of parkland owned by M-NCPPC in Prince George's County. This grouping includes playgrounds, small urban parks, picnic areas, recreation centers, and school play areas.

Regional Parks. Regional parks are larger areas serving several communities. They offer a variety of athletic facilities and outdoor recreation opportunities.

Stream Valley Parks. A long-time Commission policy has been the retention of stream valleys in open space, both publicly and privately owned, for purposes of conservation, flood protection, recreation, and aesthetics. Large tracts of stream valley land have been acquired, totaling thousands of acres. The acquisition of easements to preserve privately owned stream valley lands in open space has been developed in stream valley lands, particularly along the Northwest Branch and the Anacosta River. A number of regional parks are also located within the stream valley system.

Historic Sites and Other Special Parks. The Park and Planning Commission owns a number of historic and special parks.

Camping. Prince George's County offers a variety of camping opportunities ranging from facilities for modern self-contained vehicles with hookups to relatively primitive camping in natural settings. The County has campgrounds administered by federal, state, regional and private concerns. The following is a listing of the designated campgrounds according to administration (Prince George's Travel Promotion Council).

Campground	Agency Administration	Description	Fee (Base)
Cherry Hill Campcity	Private	100+ RV sites, open year round, heated restrooms, showers, laundromat, telephone and drink machines	$8.00 a night
Greenbelt Park	NPS	174, tent, trailer & RV campsites-no utility hookups. Restrooms, tables, fireplaces, dumping facilities. Trail systems. 14 day limit w/5 day summer limit.	$2.00 a night
R.M. Watkins Park Region	Region	34 tent and trailer campsites, no utility hookups	$3.50 a night
Louise F. Costa Park	Region	24 tent and trailer campsites - no utility hookups available	$3.50 a night

Cedarville Natural Resources Management Area	State	130 tent and trailer campsites, no primitive camping or woodfires allowed	$4.50 a night

Equestrian Trails. The history of Maryland, going back to Colonial times, reveals a deep interest in recreational horseback riding.

At present, there are over 3,000 horses in Prince George's County, one in seven of which is a racehorse. Horseback riding is a dominant recreational activity in Prince George's County.

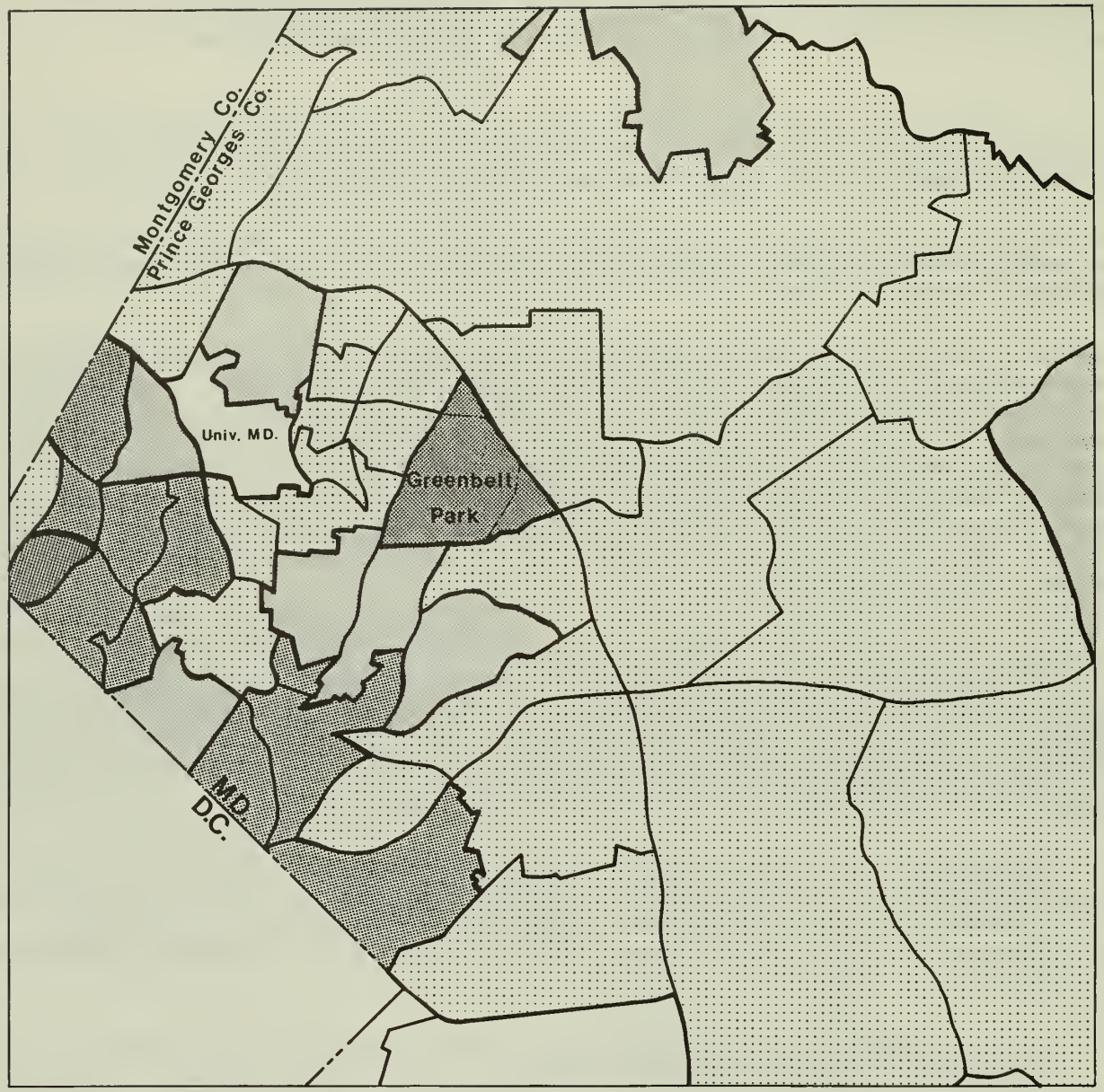
The Park and Planning Commission provides developed riding trails in the Cosca Regional Park and permits a limited amount of horseback riding in most of its other recreational areas. The National Park Service provides six miles of horse-and-foot trail in Greenbelt Park, and the State of Maryland permits riding on five miles of trails in Cedarville State Forest. Most trail riding in the County, however, is conducted on private property and along utility rights-of-way. Favorable conditions under these circumstances are fortuitous. Although most horsemen seem to find someplace to ride, no continous, planned system exists at the present time.

Park and Recreation User Profile. A profile of park and recreational users of Prince George's County was compiled based on the results of a recreational users survey conducted by the Institute for Urban Studies, University of Maryland. The factors described below are those most likely to characterize the park and recreation user. In addition, a summary profile of the non-user of parks and recreational facilities is presented.

Household. In general, medium to large families are more likely to use parks and recreation facilities than small families. Families with 3 to 5 members in the household are most likely to use park and recreation facilities. Six to ten member families have the next highest percentage of use.

Educational Level - Main Wage Earner. Park and recreation facility usuage is directly proportional with education level of the main wage earner; the higher the educational level, the more likely to use parks, recreational facilities and programs.

Household Income. Households with extremes of income are least likely to use parks and recreational facilities. Families with incomes less than $6,000 and over $38,000 are least likely to use parks and recreational facilities. Family income between $19,000 and $38,000 are the primary park and recreational facilities users.



PERCENTAGE OF NEIGHBORHOOD AREA

0 - 5 %

6 - 10 %

11 - 25 %

26 % +

1 0 1 2 3 MILES

1 0 1 2 3 4 5 KILOMETERS

N

PARK AND RECREATION AREAS GREENBELT PARK

MARYLAND

UNITED STATES DEPARTMENT OF THE INTERIOR / NATIONAL PARK SERVICE

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Age of Main Wage Earner. The age category of the Main Wage Earner who are the heaviest park and recreational facilities users is 25-44 years. After age 45, usage drops off significantly.

Time Lived in Home. In general, usage is inversely related to the length of time the family has lived in its home. The exceptions to this are the newest residents of the County who have lived in their homes less than 2 years. The heaviest users are persons who have lived in their home 2-5 years.

Residence Type. Homeowners and renters do not differ significantly in the percentage of the respective groups who use parks and recreational facilities. The same is true for multi-family units vs. single family homes.

Race. White residents of the County are more likely to use parks and recreational facilities and programs than black residents.

Transportation. Park and recreational facilities usage is directly proportional to the number of cars and trucks owned by the household.

The variables which showed a statistically singificant relationship to park and recreational facilities usage are: family size, length of time lived in a residence, age and education of the main wage earner, household income and the number of cars and trucks in the household.

Non-User of Public Park and Recreation Facilities. The person who reports he or she does not use public parks and recreation facilities is the subject of this section.

Household Size: Non-user household size is smaller than user households, with the majority being 2-member households.

Education - Main Wage Earner: The education of the main wage earner for non-users is lower than that of users.

Household Income: The non-user category contains people with extremes of income. Households with incomes under $6,000 and over $38,000 are not likely to use park and recreation facilities as are other income categories.

Age of Main Wage Earner: The percentage of non-users in the main wage earner age category of 25-44 years is close to 1/3 of that of users. The non-user category has a large percentage of persons in the over-55 age category.

Time Lived in Home: Non-users have lived in their present homes longer than users. For example, 34% of non-users have lived in their home eleven years or more, as opposed to only 19% of the users. In the heavy user category of 2-5 years residence, the non-user category has 13% fewer households.

Residence Type: There is not a substantial difference between users and non-users in terms of residence type or ownership vs. renters.

Race: There is a larger percentage of black residents not using parks and recreation facilities than white residents.

These demographic characteristics of the non-park and recreation facilities user reinforce those factors we expected to find after examining the characteristics of the park and recreation facilities user.

A generalized profile of the non-user of park and recreation facilities could be summarized as the households being smaller, representing extremes of income, longer-time residents of the County with fewer cars that the user. Also, the main wage earner is likely to be older and less well educated than the user.

Public Attitude Survey. Research in the field of outdoor recreation increasingly indicates the need for incorporating user preference and expectations into the resource planning process.

Information regarding visitor characteristics, use and preference are important if resource managers and planners are to effectively evaluate the extent to which they are providing experiences which tend to satisfy visitor demands. With this concept in mind, public attitudes toward existing and potential recreational resources of Prince George's County also were gathered as part of the University of Maryland recreation user survey. The more important attitudes that may have implications for Greenbelt Park are presented below:

Consideration should be given to increasing the percentage of undeveloped or "open space" park and recreational areas in proportion to active use areas.

Justification: An overwhelming majority of respondents to the mail questionnaire favored leaving more parkland in their vicinity in an undeveloped or natural state: 72%

Quantitative practicability of existing standards should be evaluated in light of current acquisition policies and fiscal capabilities.

Justification: When asked about types of facilities and programs which were important in improving future recreation opportunities, the highest-ranked items were those which showed a strong land orientation.

Increase realization of the importance of maintenance operation in establishing and sustaining a quality park system.

Justification: In Prince George's County, 31% of the respondents answered "yes" when asked if anything in the parks, community centers or recreation areas needs better care. Repair of equipment and upkeep of restrooms were items most frequently mentioned.

Strong acceptance of a mandatory dedication policy is apparent. Increased dedication requirements may be indicated.

Justification: 86% of those questioned answered "strongly agree" or "agree" to the statement that more open space should be required in subdivision, apartment or commercial developments.

Efforts should be made to increase the use of public transportation to public parks.

Justification: When people were asked how they got to parks, schools, or recreation centers, less than 1% said they used the bus. Yet three-fourths of the respondents said that public transportation such as buses was within easy walking distance of their house.

A review of techniques used to involve citizens in agency decision-making, particularly at the local level, should be undertaken.

Justification: In Prince George's County, 46% of the respondents said that planners and officials who have responsibility for park and recreation programs in their neighborhood do not pay enough attention to the leisure time needs of local people. Crowding in park and recreation facilities is a problem for users at some time in some facilities. Efforts to minimize this problem should go beyond the simple solution of building new facilities.

Justification: In the mail questionnaire, 44% of the people thought public parks and recreational facilities were too crowded when their family wished to use them.

Current recreation programs and activities are not being utilized by the entire spectrum of the County population. Policy decisions are needed to direct future programs to current program uses or alter them to attract the non-users.

Justification: Current programs are being utilized by certain categories of people in the County. However, in the mail survey, 45% of the respondents who infrequently or never used recreational programs did not because there was little or no interest in the household. 35% did not pursue recreational activities because facilities and programs were not available.

A renewed effort should be made to publicize recreation and park services to residents in Prince George's County. While the most typical way residents find out about M-NCPPC is through newspaper articles, agency mailings and friends and neighbors, other methods of publicity might be tried.

Justification: In Prince George's County, 53% of the respondents to the mail questionnaire said residents of the County were not well informed about M-NCPPC services. Additionally, it should be noted that non-users of public park and recreation facilities tended to have a disproportionately high percentage of new residents, non-whites and the wealthiest and poorest households. While obviously publicity is not the only reason for such non-use, it may be a contributing factor.

Consideration should be given to a program of concerts in park perhaps at less-crowded parks or at less-crowded times.

Justification: When park users were asked if there were any activities which were really important to them they would participate in if provided in parks, concerts were mentioned by five percent of respondents in each County, one of the highest percentages of any activity mentioned.

COMMUNITY

For purposes of planning and analysis, the General Plan for Prince George's County has divided the county into several subregions. In order to gain a community perspective of Greenbelt Park, the following section describes the characteristics of subregion II, that area that encompasses Greenbelt Park (Vicinity Map, page 50).

Subregion II lies immediately northeast of Washington, D.C., and consequently is influenced by social and economic conditions of the District. Subregion II has the highest population density of any area within the county. The 1976 population estimate was 233,260 representing 35 percent of total county population (M-NCPPC, 1979). Accordingly, Subregion II has the highest concentration of dwelling units in the county with a higher representation of multi-family than single-family units. The subregion also has a high proportion of older homes in that over 50 percent of all homes in the county built prior to 1940 exist within Subregion II. Although the subregion has the highest concentration of population and housing in the county, it has one of the lowest median house values (1975 estimates of $36,545 compared to a county average of $39,200). The county assessor's file indicate that Subregion II had by far the greatest proportion of low to moderately priced new homes and, conversely, the smallest proportion of higher priced homes of all areas of the county.

Subregion II had the smallest household size in 1970 with a median figure of 2.6 compared to a county average of 3.1 persons per household.

The median family income of the subregion was slightly below the county average in 1970 ($12,063 compared to a county figure of $12,627).

The black population of Subregion II is fairly large in absolute numbers. However, in terms of percent of total population, the subregion is well below the county average (4.8 percent compared to a county average for all subregions of 13.8 percent).

Regarding trends in educational facilities, several elementary and senior high schools in this subregion have excess capacity. Due to the decline in the number of school-age children in the subregion, most elementary schools have excess capacity. Four elementary schools were closed at the end of the 1976-77 school year: Ager Road, Brentwood, College Park, and Holly Park (M-NCPPC, 1977).

In terms of land use, Subregion II is the most highly developed area in the county with nearly 80 percent of its land area presently developed. This is significant when compared to the county as a whole that is only 40 percent

developed. Of the developed land in Subregion II, approximately 48 percent is in residential use, 4 percent in commercial use, 3 percent in industrial use, and 45 percent in institutional use. Note that the institutional category consists primarily of tax exempt lands. Since a large number of tax-exempt areas are either directly or indirectly open space uses, open space is also considered under the institutional category. It is important to note the unusual location of the multi-family residential development "Westchester Park Apartments" situated on a 75-acre site that juts into the western edge of the park along Kenilworth Avenue opposite Berwyn Heights (Park Map, page 4).

North of the East Park and adjacent I-495 and Baltimore-Washington Parkway the Western Development Corporation is developing a shopping-center/office complex, the initial phase of which will emcompass 220,000 square feet. Abutting the Park to the East is the single-family housing development of New Carrollton. This property line is unfenced. South of East Park is more single-family development.

Across the Baltimore-Washington Parkway, south of West Park, is Parkdale High School, which contributes to Park visitation. To the south of Greenbelt Park is an area of very low-density development with a potential for more intense development.

Most natural areas are located within the county's regional parks, the closest being Watkins Regional Park in the central portion of the county. Cosca and Patuxent River Park are the two other regional parks, both being situated in south Prince George's County. A large bi-county park is presently being planned (M-NCPPC) in the northern portion of the county that will occupy property in both Montgomery and Prince George's Counties. Also, alternative recreational uses are presently being considered for the 585-acre Enterprise Farm situated in central Prince George's County. Depending on the degree of development, this site could provide a variety of natural, cultural, and recreational resources for the enjoyment of Prince George's County's residents. This site is approximately 5 to 6 miles southeast of Greenbelt Park.

PHYSICAL ENVIRONMENT

PHYSICAL ENVIRONMENT

PHYSIOGRAPHY

Prince George's County lies primarily in the physiographic province called the Atlantic Coastal Plain. This plain is underlain by unconsolidated depoists of gravel, sand, silt, and clay that range in age from cretaceous in the northern part of the county to recent on the flood plains. That part of the plain in which Greenbelt Park is found is cut by V-shaped valleys with short, steep slopes with differences in elevation of approximately 150 feet (Topographic Relief, page 88).

GEOLOGY

A complete geological report is found in Appendix E and a Geology Map on page 89. A summary of the report is given below.

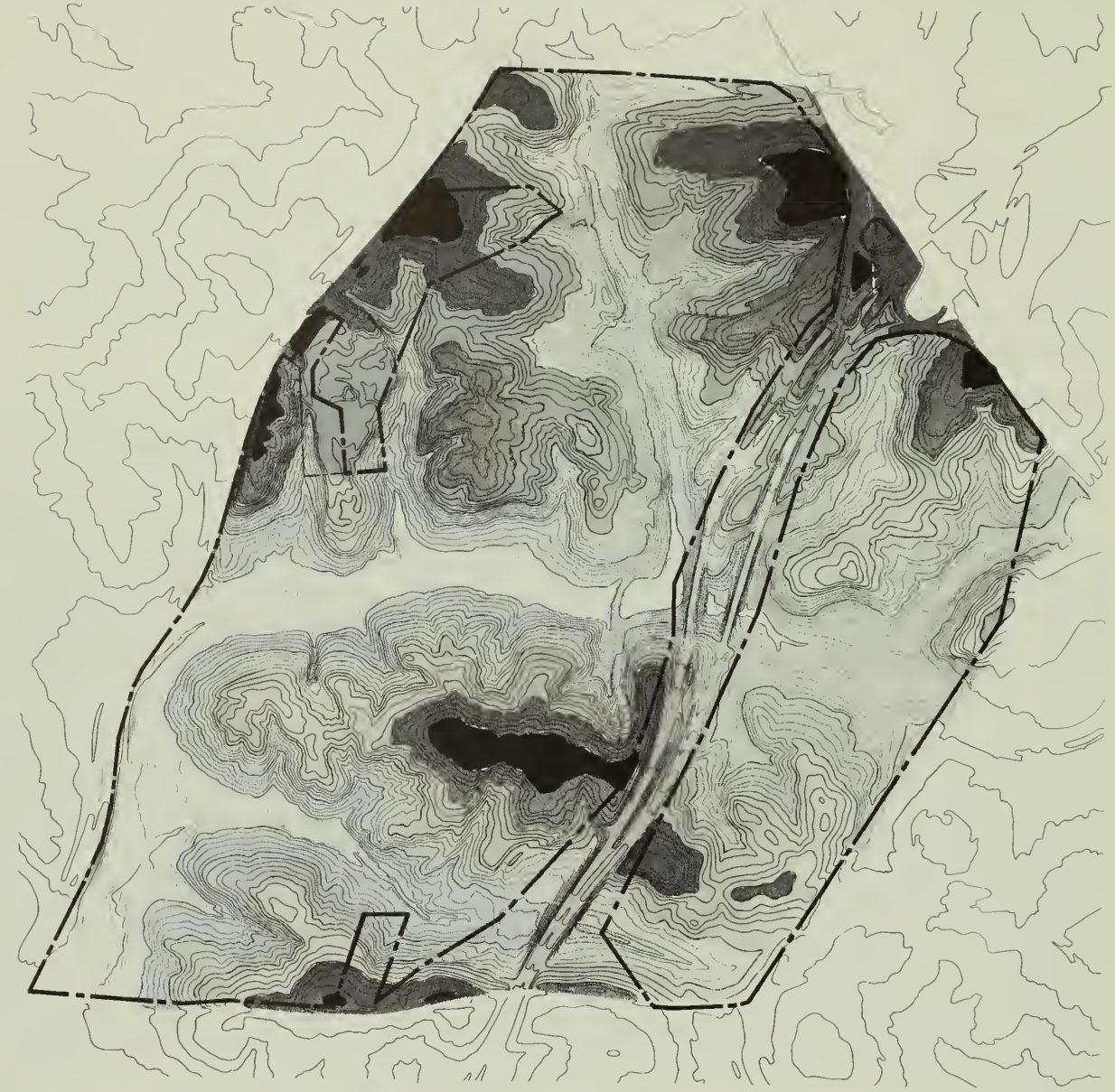
Greenbelt Park lies in the inner Coastal Plain on ancient fluvial sediments of the Potomac group of lower cretaceous age (120 to 100 million years). The sediments consist of clay, silt, sand, and gravel, with clay and silty clay making up by far the largest part. Tertiary or Quarternary gravel (probably 1 to 5 million years old) overlies the cretaceous sediments in the northwest corner of the Park. The stream valleys generally have broad alluvial floors.

The Potomac group is divided into lower clay units, which are found only in the western part of the Park. Exposures occur in some hillside gullies and in Deep Creek, which is incised as much as 10 feet (3m) below the alluvial valley floor. These are overlain by a bed of gravel that underlies the service area near the Park Headquarters. The gravel is thickest in the western part of the Park and crops out in Deep Creek, a short distance west of Park Central Road, where it is 1 (.3m) to 3 (1m) feet thick. The area inside the Dogwood Trail circuit is composed of a sand and clay unit. In addition a section of high terrace gravels occurs near the Westchester apartment complex inholding along Kenilworth Avenue in the northwest portion of West Park. A large part of this unit has been removed in the course of construction. This unit is a remnant of once more extensive channel deposits of stream that flow across the coastal plain toward the sea.

Broad areas of alluvium, as much as 8 (2.5m) feet thick, occur along Park streams. Deep channels have been eroded into the alluvium with vertical walls that resemble the arroyos of the west.

TOPOGRAPHY

The topography of the Park is rolling to steep, with many deep ravines. Slopes vary from 0^{o} to $20+^{o}$. The Park has a total relief of about 150 feet (4,500m). Stream valleys generally have broad alluvial floors. Large gullies, probably cut after deforestation in the 18th and 19th centuries crisscross the hillslopes. Some narrow ravines on steep slopes are approximate (3m) 10 to 20 feet deep and appear to be unused in valleys that were originally more shallow. Many gently sloping alluvial areas are cut by deep gullies with nearly vertical sides that, in places, expose the bedrock. They are especially impressive along Deep Creek,



25 – 50 Feet

50 – 75 Feet

75 – 100 Feet

100 – 125 Feet

125 – 150 Feet

150 – 175 Feet

175 – 200 Feet

N

500 0 500 1000 1500 2000 Feet

200 100 0 200 400 600 Meters

TOPOGRAPHIC RELIEF

GREENBELT PARK

MARYLAND

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QUATERNARY

Qal — Alluvium. Clay, silt, sand, and gravel. Generally yellow in color.

Qt — Low terrace deposits. Sand, clay, and gravel.

QTh — High terrace deposits. Sand and gravel.

SOURCE:
On site geologic survey by J.T. Hack, Geologist, U.S.G.S., completed May 1979.

LOWER CRETACEOUS

Ksc — Upper sand and clay unit. Clay, sandy clay, silty clay, sand, gravel, and concretionary layers of ferruginous sandstone and conglomerate (ironstone). Clay commonly red or veriegated.

Abundant ferruginous sandstone

Sandy and clayey gravel, commonly marks the base of this unit.

Kc — Lower clay unit. Clay and silty clay; gray or white where unweathered. Contains lignite fragments in places and some ferruginous layers.

N

500 0 500 1000 1500 2000 Feet

200 100 0 200 400 600 Meters

GEOLOGY

GREENBELT PARK

MARYLAND

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Contour interval within the park bounday and adjoining lands is 5 feet.

Contour interval for the surrounding area is 25 feet.

Contour line

Index contour — 100

Depression contour — 75

Spot elevation 199×

Based on maps furnished by the Maryland-National Capital Park and Planning Commission.

N

500 0 500 1000 1500 2000 Feet

200 100 0 200 400 600 Meters

TOPOGRAPHY

GREENBELT PARK

MARYLAND

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but also occur along Still Creek and some of its tributaries. These gullies are the result of changes in land use.

The recently acquired 18-acre Jaeger Tract forms a high bluff along the western boundary of the site, which is slowly revegetating. Sheet eroision from the site has created a gullied 10-20° slope below this bluff (Topography Map, page 90).

Slopes within the Park vary from 0-50% (Slope Map, page 92). Slope characteristics influence land use development patterns by placing constraints on the location and extent of land that may be developed for intensive uses and on the degree of development that is feasible. The percent of slope in Greenbelt Park may be classified as follows:

Preferred Slopes, 0-8 Percent

Land classified in the 0-8 percent category is very adaptable for park development. The present land use pattern in the Park resulted from earlier development trends that were oriented to large areas of preferred slopes. These areas permitted development of the family campground and picnic areas as well as for the siting of existing Park structures.

Suitable Slopes, 8-15 Percent

Land in the 8-15 percent slope range is well suited for potential development. Areas of 8-15% slope within Greenbelt Park have been used for extensions of picnic areas and the family campground, for parking areas and for the group campground.

Difficult Slopes, 15-25 Percent

Development of these slopes on a large scale has been limited because construction costs are high and this degree of slope deters intensification.

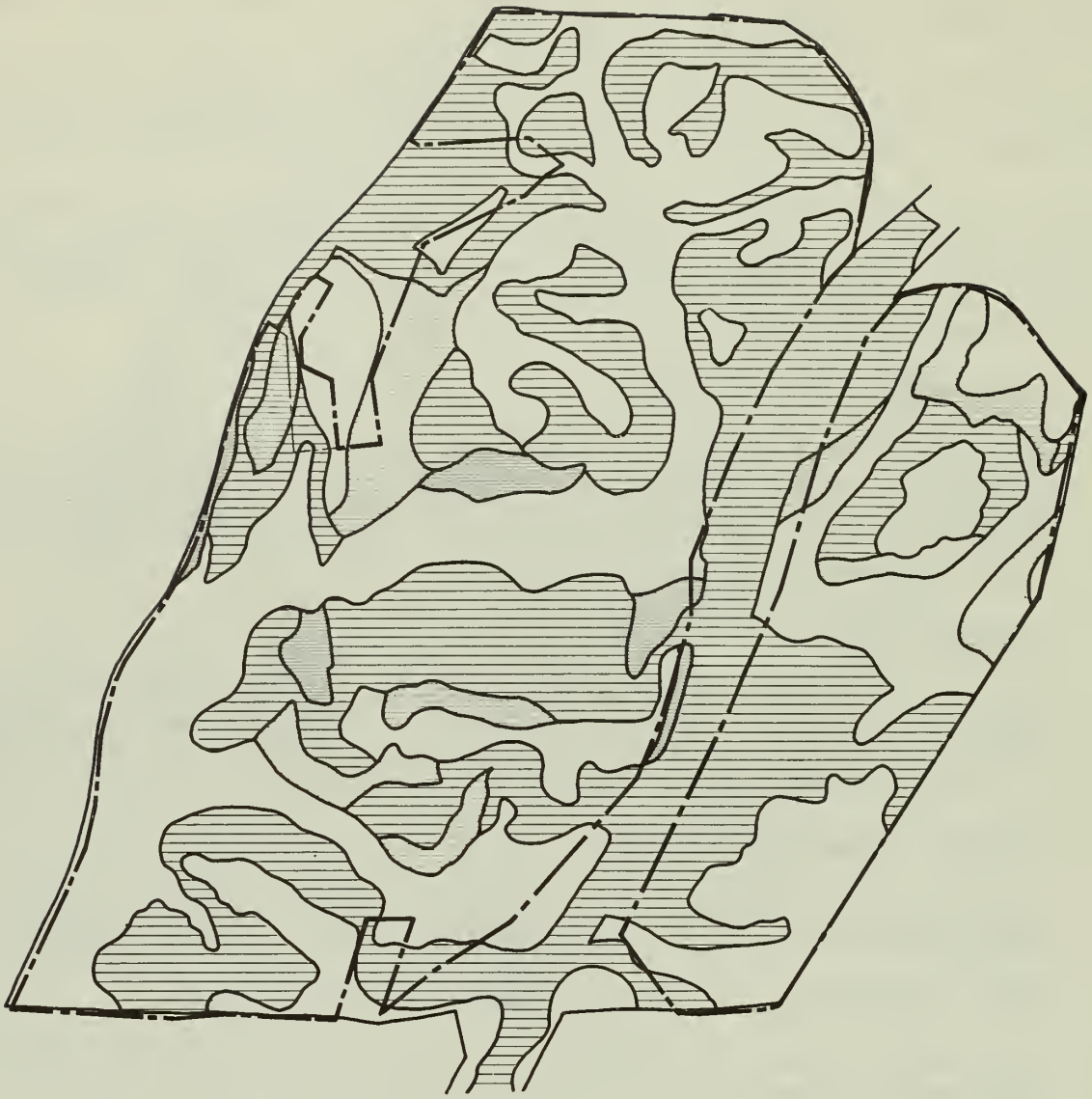
Unsuitable Slopes, 25 Percent and over

Areas having slopes greater than 25 percent are considered undesirable for development because of the prohibitive construction costs encountered when building on land with steep gradients and because of the threat and damage to building foundations during the spring thaw. This steep land is generally situated adjacent to the 15-25 percent slope category.

HYDROLOGY

A report on the hydrology of Greenbelt Park is found in Appendix F and on the map on page 95.

Greenbelt Park is intersected by two streams, Deep and Still Creeks, which flow into the Northeast Branch of the Anacostia River below Indian Creek. These streams flow in a generally southerly direction on gently meandering courses through fairly broad and uniform flood plains. The Northeast Branch, having a total drainage area of 75.1 square miles, is formed by the confluence of Paint Branch and Indian Creek, 3.2 miles upstream from its mouth near Hyattsville,



Complete data on topographic slope conditions within the park was not available during development and preparation of this map.
The slopes depicted here were derived from existing topographic and soil classification data.

Sources:
U.S.D.A.,Soil Conservation Service, Soil Survey-Prince Georges Co.,Md., dated April 1967.
Topographic data based on maps prepared by Maryland National Capital Park and Planning Commission.

0 - 8% slope, nearly level to gently sloping

8 -15 % slope, moderately sloping

15-25% slope, strongly sloping to steep

25-50% slope, steep

N

500 0 500 1000 1500 2000 Feet

200 100 0 200 400 600 Meters

SLOPE

GREENBELT PARK

MARYLAND

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Maryland. Indian Creek, drainage area 29.2 square miles, rises near Muirkirk, Maryland. The Northeast Branch is located in the Hyattsville-College Park area of Prince George's County, Maryland. Much of the land along the Northeast Branch and tributary streams has been acquired for park use. This has minimized flood damage, but there are residential, commercial, and industrial developments along the streams and parkland.

This development activity is increasing sedimentation and erosion in Greenbelt Park streams. Many alluvial areas with low slopes are active gullies with vertical to near vertical sides, which reflect changes in land use and their effects on drainage areas. When the land was extensively cultivated in the 17th and 18th centuries, soil and other sediment were removed from the uplands by soil creep sheetwash and gullying. Some of this material was carried away, but much was redeposited in floodplains in small watersheds. When agricultural land use declined in 1900, the rate of erosion on the sloping land slowed and the load of sediment declined. The streams responded by entrenching their floodplains. The deep arroyo-like features that cut the floodplains of Deep and Still Creeks and some of their short tributaries result from the decline in the sediment supply of upland areas.

Portions of these areas have been inundated by floods of the past, and a substantially greater area is within reach of the potentially greater floods of the future.

The U.S. Geological Survey has maintained a stream-gaging station on the Northeast Branch at Riverdale Road continuously since 1938. Results of this monitoring are presented in Appendix G. The greatest flood known to have occurred on the five streams was in August 1933. The main flood season for the Northeast Branch and it tributaries is summer and early fall. Most of the higher floods have resulted from intense, local thunderstorm activity or hurricane-type storms of tropical origin. However, large floods may occur at any time, particularly on small streams, such as Deep and Still Creeks.

Velocities of water during major floods range up to 9 feet per second (about 6 miles per hour) in the channel of the Northeast Branch. Velocities on the flood plain vary widely, depending on location, but generally are less than 4 feet per second. Velocities greater thatn 3 feet per second, combined with depths of 3 feet or greater are generally considered hazardous.

The durations of floods are relatively short on all streams in the Anacostia River Basin. Stages can rise from stream bed to extreme flood peaks in less than 10 hours following intense rainfall. During the 100-year flood, a flood having an average frequently of occurrence of once in 100 years, Northeast Branch would have a maximum rate of rise of about 1 foot per hour and remain out of bank for almost one day. During Standard Project Flood on the Northeast Branch, the stream would rise 13 feet in 18 hours, with a maximum rate of rise of 2 feet per hour, and would remain out of bank for about 30 hours. A Standard Project Flood is the flood that may be expected from the most severe combination of meteorological and hydrological conditions that is considered reasonable characteristic of the geographical area in which the drainage basin is located, excluding generally about 40 percent to 60 percent of the probably maximum floods for the same basins. Such floods, as used by the Corps of Engineers, are intended as practicable expressions of the degree of protection that should be sought in the design of flood control works, the failure of which might be disastrous.

Hazardous conditions occurring during such floods result from rapidly rising streams, high stream velocities, and deep flows. Except for protection provided by levees to downstream areas, below Riverdale Road on the Northeast Branch, there are no other existing or authorized flood control projects upstream in the watershed.

Greenbelt Park does not receive specific flood warnings or forecasting services from the U.S. Weather Bureau at this time. General weather forecasts of intense rainfall with accompanying flash flood warnings are issued by the Weather Bureau Office at Suitland, Maryland, in Prince George's County.

Estimated peak discharge at the Indian Creek sampling station, located 1.14 miles above the mouth of the Anacostia River at the Berwyn Road Bridge on August 23, 1933 was 6,500 cubic feet per second. Other than effects due to bridges and their approaches, there are no significant obstructions to flows in the Northeast Branch, Indian Creek and Deep and Still Creeks.

On August 23, 1933 a West Indian hurricane, accompanied by high winds and heavy rainfall, extending from August 20 to 24, produced the highest flood of record in the Anacostia River Basin upstream from the tidal reaches. It is estimated that flood damages caused by this storm were equal to, or slightly above, the 100-year flood level on the Northeast Branch and Indian Creek.

On August 21, 1963 a severe rainstorm centered over southeast Washington, D.C., caused flash flooding and the greatest flow in the Northeast Branch since 1933. Although flows exceeded channel capacity in many areas, flood damage was limited by the extensive parklands bordering the river and tributary streams.

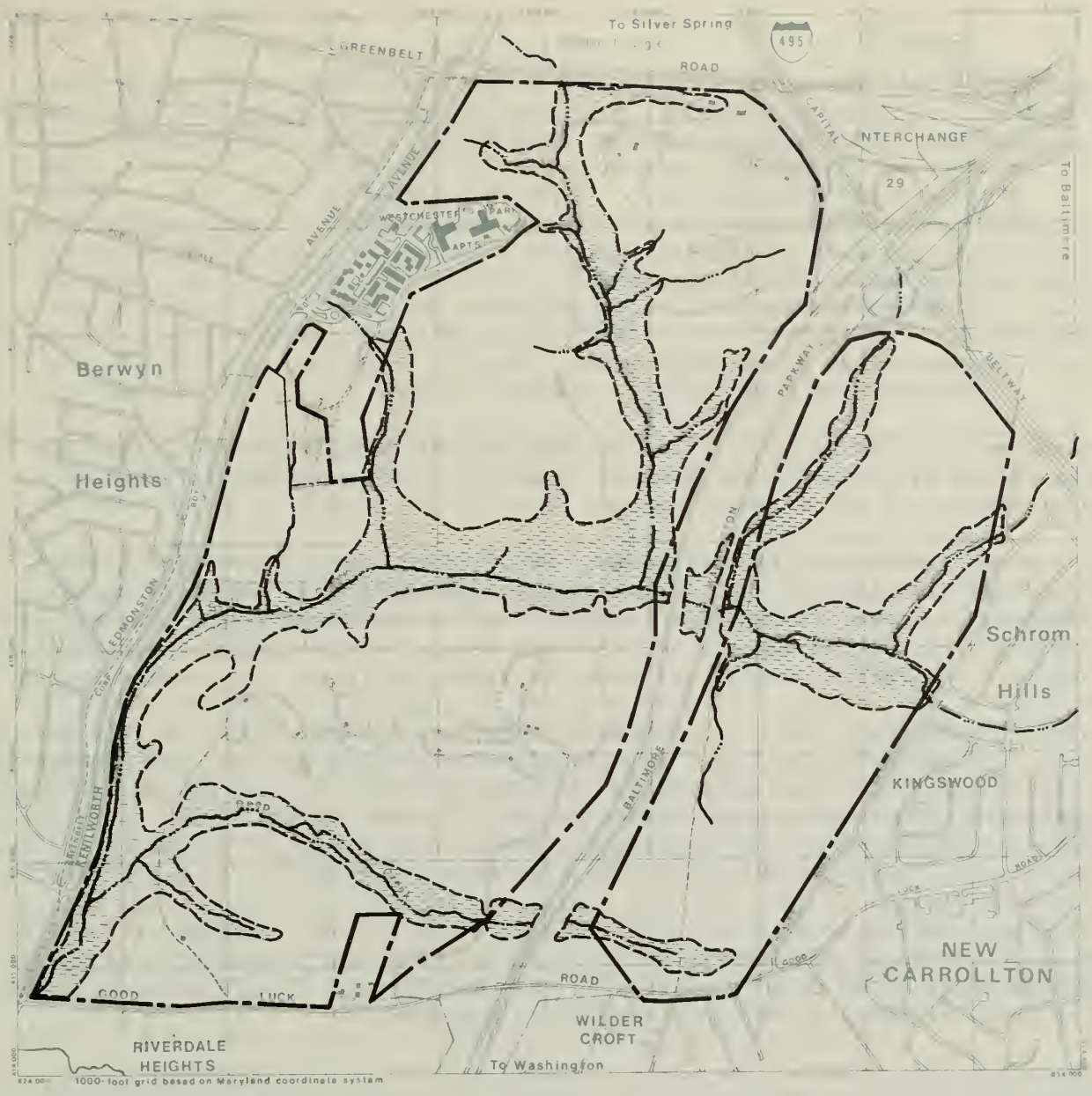
Source: Flood Plain Information, Northeast Branch, Northwest Branch (Anacostia River), Paint Branch, Indian Creek, Sligo Creek. Prince George's County, Maryland. 1968. Baltimore District, Corps of Engineers.

CLIMATE

The Washington Metropolitan Area has an average rainfall of 40 inches, and an average of 112 inclement days during the year. Approximate average temperatures for the four seasons are: winter, 48 (9°C) degrees; spring, 75 (24°C) degrees; summer, 83 (28°C) degrees, and fall, 57 (14°C) degrees.

Greenbelt Park has a climate similar to the Washington D.C. area. It has warm and humid summers and generally mild winters. The approximate mean temperatures for the four seasons are: Winter - 37 (3°C) degrees; Spring - 54 (12°C) degrees; Summer - 75 (24°C) degrees; and Fall - 58 (14°C) degrees. The coldest weather occurs in late January and early February, and the warmest occurs in July. There are no well pronounced wet and dry seasons.

Average Annual Precipitation -- 43.47 inches
Average Annual Snowfall -- 18.20 inches



Data on flooding conditions within the park was not available during development and preparation of this map.

The 100 Year Flood Prone Area shown was derived from existing topography and soils limitation data and is approximate only.

Stream

100 Year flood prone area line (approx.)

Sources:
U.S.D.A., Soil Conservation Service,
'Soil Survey-Prince Georges Co.,Md.
dated April 1967.

Maryland National Capital Park and Planning Commission maps for topographic data.

N

500 0 500 1000 1500 2000 Feet

200 100 0 200 400 600 Meters

HYDROLOGY

GREENBELT PARK

MARYLAND

UNITED STATES DEPARTMENT OF THE INTERIOR / NATIONAL PARK SERVICE

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Temperatures

Average Daily Maximum, January -- 43.8 F (6.6°C)
Average Daily Minimum, January -- 24.2 F (-4.3°C)
Average Daily Maximum, July -- 87.9 F (31.1°C)
Average Daily Minimum, July -- 64.3 F (17.9°C)

Average Annual No. of Days with
Temperatures over 90 °F -- 46

Average Annual No. of Days with
Temperatures under 32 ° F --105

A summary of climatological data for the College Park, Maryland station for the period 1951-1974 is included in Appendix H. This station is located approximately 3 miles from Greenbelt Park.

There are a number of factors which control the climate of Maryland. The most important factors include: the distribution of land and water masses; mountain barriers; topographic features; semi-permanent pressure centers; prevailing winds at the surface and at upper levels; storm tracks, including tropical and extra-tropical cyclones; latitude; altitude; and ocean currents.

Since the general flow of the atmosphere in temperate latitudes is from west to east, the expansive land mass immediately to the north and west predisposes the Maryland area to a continental type of climate. This type of climate in middle latitudes is marked by well-defined seasons. Winter is the dormant season for plant growth based on low temperatures rather than drought. In spring and fall the changeableness of the weather is a striking feature. It is occasioned by a rapid succession of warm and cold fronts associated with cyclones and anticyclones which generally move from a westerly direction. Summers are warm to hot. The highest atmospheric humidity along the Atlantic coastal area causes the summer heat to be more oppressive and the winter cold more penetrating than for drier climates of the interior of the continent.

The prevailing winds at the surface are determined by the frequency and intensity of anticyclones and cyclones which persist or move over the area. The preponderance of anticyclonic circulation over the northern portion of the continent in winter brings a high percentage of cold northwesterly winds to the Maryland area. Consequently, the prevailing winds are from the northwesterly quadrant from October through June.

This pattern changes in summer as the semi-permanent Atlantic High moves northward and westward and dominates the circulation of air over the eastern United States. At this time a flow of warm, moist air spreads over the area with winds from the southwesterly quadrant most of the time.

Located along the east coast with prevailing westerly winds, the Gulf Stream and the Atlantic Ocean are only moderately effective in influencing the temperatures of Maryland. Nevertheless, the relatively frequent easterly winds associated with cyclonic storms to the southeast bring about movement of air off the warm sater and, consequently, tend to raise the normal winter temperatures and to lower the summer temperatures.

The average frost penetration ranges from about 5 inches or less in extreme southern portions of Maryland to more than 18 inches on the Allegheny Plateau. In extremely cold winters maximum frost penetration may be double the average depth.

The average annual precipitation ranges from as much as 49 inches at places in the Allegheny Plateau and southern Eastern Shore area, at extreme ends of the State, to as little as 36 inches in the Cumberland area located in the "rain shadow" to the east of the Allegheny Plateau. Elsewhere over the State, the annual precipitation generally ranges between 40 and 46 inches. Distribution is quite uniform throughout the year, averaging between 2 and 4 inches each month except for a late spring and summer maximum of 4 to 5½ inches.

Although the heaviest precipitation occurs in the summer, this is the season when severe droughts are most frequent. Summer precipitation is less dependable and more variable than in winter.

The seasonal increase in use of water by plants and evaporation (evapotranspiration) during the summer, together with the occurrence of a dry period, results in a rapid loss of soil moisture and contributes to the development of drought conditions.

In summer the northern portion of the continent is dominated by low pressure, and the mean storm tracks are displaced far to the north of Maryland.

Mean wind speeds at the surface vary from 9 to 10 mph in summer and fall to 10 to 12 mph in winter and early spring. The highest mean speeds are associated with the frequent passages of well-developed cyclones and anticyclones, which bring the strong winds and changeable weather of early spring.

Maryland lies just south of the mean position of the upper westerlies in winter and well to the south of the axis of the zonal westerlies in summer. The movement of cyclones and anticyclones over the Maryland area as in other regions is influenced to a large extent by the speed and direction of the upper level winds, which flow around the hemisphere in a wavelike pattern.

In Maryland any arrangement of cyclones and anticyclones which causes a drift of air from the continent to the ocean tends to bring fair weather, air movement from the ocean to the continent results in increasing cloudiness and a tendency for rain. Therefore, for Maryland, winds from northeast to south tend to be rain-producing winds and southwest to north winds are usually associated with dry, fair weather.

A well-developed high pressure system over New England or the St. Lawrence Valley and a well-developed low pressure system over Georgia, Tennessee, or the Ohio Valley is the most favorable situation for rain in Maryland, while the reverse usually produces clear, dry weather.

Nearly all migrating cyclones and anticyclones crossing the United States travel from west to east. By far the greater number of cyclones travel in a northeastward direction in a path about 300 to 500 miles north of Maryland, but their influence extends southward to the Atlantic Coast and does affect Maryland.

Storms which originate in the Gulf of Mexico, the southeastern United States, or adjacent Atlantic coastal regions, frequently move northeastward or northward along the Atlantic Coast and can bring violent, destructive weather to the Maryland region. As these storms approach the Maryland area from the south, strong easterly to northeasterly winds bring widespread rains and cause higher than normal tides along the Atlantic Coast and on the west side of the Chesapeake Bay. This type of storm is commonly termed a northeaster. Tropical cyclones or hurricanes which develop in the West Indies, the Caribbean, or the Gulf of Mexico sometimes move into, but rarely pass entirely over the State. These systems also cause cloudy weather, heavy rains, and high tides.

Elevations that range from sea level in eastern portions to over 3,000 feet on the Allegheny Plateau have a significant effect on temperature conditions in Maryland. In general, the topography has the effect of reducing the temperature about 1°F (.5°C) per 300 feet, particularly in summer. In winter, the mean temperature decreases with altitude averages slightly less than 1°F (.5°C) per 300 feet. In the winter season the effect of elevation is sometimes a critical factor in determining whether the precipitation will fall in the form of rain or snow. Even in Baltimore the elevation difference of 300 to 500 feet sometimes contributes to precipitation in the form of rain in lower portions of the city and heavy snowfall in the higher districts, due to a slight decrease in temperature with elevation.

Average annual snowfall over Maryland ranges from a minimum of 8 to 10 inches along the coastal areas of the Southern Eastern Shore division to a maximum well over 70 in Garrett County. Actually, there is a variation in the annual average from about 30 inches to over 100 inches in this county. During the 1960-61 winter season, the total snowfall was 149.4 inches.

Snow flurries are reported as early as September on the Allegheny Plateau, and in October in extreme eastern portions of the State. The last snowfall in eastern portions usually occurs in April and on the Allegheny Plateau in May. Even in the warmest winters snow falls in Maryland; however, averages for a climatological division may be less that 1 inch for the season.

Late season snowfalls in March and April are sometimes quite heavy. On April 3, 1915, a late snowstorm dropped snowfall amounts up to 15 inches on the Delmarva Peninsula at Sudlersville and Dover. At Salisbury a total of 10 inches fell in this storm. Ice Storms or heavy wet snow occasionally take a heavy toll of powerlines, shrubs and trees.

Thunderstorms are reported at a given station on an average of 30 days per year in eastern portions of Maryland and 40 days per year in western portions. They occur in all months of the year, but during the 4-month cold season from November through February an average of less than one storm per month is observed. An average of one thunderstorm per year occurs in each of the months, March and October. May, June, July, and August make up the thunderstorm season and include from 75 to 80 percent of the thunderstorms which occur annually. July is the peak of the season with about 25 percent of the annual total number of thunderstorms. As few as 10 and as many as 50 thunderstorms have been observed in a given locality during the year.

Hail at a given station occurs on an average of 1 day per year in eastern portions and about 2 days per year in western portions. The total number of days on which hail is observed at one or more stations in Maryland averages about 18 to 20 per year. Hail has been observed in all months of the year; however, occurrences in the 7-month period from September through March are infrequent. The number of days with hail at one or more stations increases from an average of 1 in April to about 5 in July, the peak of the hail season, and then decreases to an average of 3 in August.

Although spring thunderstorms are much fewer in number than summer thunderstorms, they have a much greater tendency to occur with hail. Most of the hailstorms occur between 2 and 9 p.m. Severe, devastating hailstorms occur somewhere in the State about once every 5 years on the average.

Tornadoes occur infrequently in Maryland, and of the ones that do occur most are small and result in nominal losses. About 20 percent of the tornadoes occur on the eastern shore, 25 percent in southern Maryland, 40 percent in north-central Maryland, and 15 percent in western Maryland. Approximately 70 percent of the tornadoes occur between 2 and 9 p.m. with a preponderance from 3 to 6 p.m.

Most tornadoes in Maryland tend to travel in the usual southwest to northeast direction, but a few have been reported to travel southeastward or in a southerly direction.

Usually paths are not more than a few miles in length; however, 10 to 15 percent of these storms maintain paths of 20 miles or more in length.

Average relative humidity is lowest in the winter and early spring from February through April and highest in the late summer and early fall from August through October.

Source: Climate of Maryland. 1977. National Oceanic and Atmospheric Administration National Climatic Center

SOILS

A complete soils report is found in Appendix G. A summary follows.

There are 5 soil units in Greenbelt Park which are composed of 20 major soil types or series (Soil Units, page 221). Predominant is the Christiana-Beltsville-Sunnyside Association. The underlying material is primarily red clay. The Christiana soils are red, deep and well-drained, but moisture moves slowly through them. Sunnyside soils are also red, deep, and well-drained, but they have a less clayery, more permeable subsoil. The moderately well-drained Beltsville soils have a dense, almost impermeable subsoil.

Because this Association lies between Washington, D. C. and Baltimore, Maryland, much of it has been used for residential and industrial development. This development is limited on the Sunnyside soils to areas of gently slope. Residential uses of Christiana soils are severely limited by their clay subsoil. Christiana soils are unstable when saturated, especially if moved, graded, or otherwise

disturbed. These soils tend to cave, slump, and flow when they are wet or are under the load of buildings, roads, or other structures. Upon drying, the soil material may shrink away from footings and foundations. Both Beltsville and Christian soils are unsuitable for septic tanks. On-site engineering surveys and studies should be made where heavy permanent installations are proposed on the soils of this association.

The soil association supports second-growth hardwoods and pines at various stages of maturity. These soils are not naturally fertile and vegetative growth on Beltsville soils is limited by fragipan, or hardpan, at a moderate depth. Because the clay in the subsoil absorbs water slowly, runoff is moderately rapid and eroision is likely. Special measures are needed for controlling erosion.

Additional soil series found in Greenbelt Park include Iuka soils, which are steep, erodable and suitable for woodland or limited grazing. The Bibb series is found on floodplains along streams. Residential use is limited by flooding and poor drainage. Most areas of this soil are covered by forest consisting of maple, gum, oak, and other hardwoods that tolerate wetness.

Chillum soils are also found in the Park. Use of this soil is limited by a thin root zone, a small capacity for storing mositure, droughtiness and severe erosion. The mature vegetation is upland hardwoods, mainly oak, but in several areas much of it is Virginia pine. The Elkton soils found in Greenbelt are poorly drained, nearly level to gently sloping soils found on upland flats. Drainage is a major management problem and ditches must be closely spaced.

Additional soil types occurring with Greenbelt Park include the Sassafras, Aura, Elsinboro, Fallsington, Galeston, Evesboro, Iuka, Marr, Mattawan, Mattapex, Muirkirk, and Rumford Series. Sections of sandy, sandy and clayey and slity and clayey lands, which are miscellaneous land types exposed mainly on the steep slopes along ravines and stream valleys. A complete description of these soil series is found in Appendix G.

The Sweetgum picnic area is located over an area of urban land complex soils, which consist of a landfill formerly used by the city of Greenbelt.

The limitations placed upon potential development of facilities and buildings, picnic areas, paths and trails, and sport fields are graphically illustrated on pages 101 (Soil Limitations: Facilities/Buildings), 102 (Soil Limitations: Picnic Areas), 103 (Soil Limitations: Paths/Trails), and 104(Soil Limitations: Sport Fields).

ENVIRONMENTAL QUALITY

Water

Several intermittent streams are tributary to the two permanent streams, Deep and Still Creeks, which cross the Park. Since the creeks are extensions of the Anacostia watershed, both pass through areas of extensive urban development before entering the park. The main source of pollution is, therefore, sedimentation.

Slight limitation or good suitability for the specific use.

Moderate limitations or fair suitability for the specific use.

Severe limitations or poor suitability for the specific use.

SOIL LIMITATIONS:

FACILITIES/BUILDINGS

GREENBELT PARK

MARYLAND

N

500 0 500 1000 1500 2000 Feet

200 100 0 200 400 600 Meters

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Slight limitation or good suitability for the specific use.

Moderate limitations or fair suitability for the specific use.

Severe limitations or poor suitability for the specific use.

N

500 0 500 1000 1500 2000 Feet

200 100 0 200 400 600 Meters

SOIL LIMITATIONS:

PICNIC AREAS

GREENBELT PARK

MARYLAND

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Slight limitation or good suitability for the specific use.

Moderate limitations or fair suitability for the specific use.

Severe limitations or poor suitability for the specific use.

N

500 0 500 1000 1500 2000 Feet

200 100 0 200 400 600 Meters

SOIL LIMITATIONS:

PATHS/TRAILS

GREENBELT PARK

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Slight limitation or good suitability for the specific use.

Moderate limitations or fair suitability for the specific use.

Severe limitations or poor suitability for the specific use.

N

500 0 500 1000 1500 2000 Feet

200 100 0 200 400 600 Meters

SOIL LIMITATIONS:

SPORT FIELDS

GREENBELT PARK

MARYLAND

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Water Quality Standards for the State of Maryland are given in Appendix H and apply to turbidity, fecal coliforms, hydrogen-ion concentration (pH), and dissolved oxygen in the water sampled, as well as temperature. Turbidity is a measure of the light that will pass through a water sample and indicates the amount of solid material suspended in it. A turbidity of over 130 units is considered an inhibitor of fish productivity. Fedal coliforms are a group of bacteria which predominantly inhabit the intestines of warm-blooded animals, including man. The presence of these bacteria is considered to be indicative of the possible presence of desease-causing organisms. The monthly average of these organisms should not exceed 1,000 per 100 milliliters of sample or a maximum daily count of 2,400 per 100 milliliters of sample.

Dissolved oxygen (DO) levels of 40 milligrams per liter are considered necessary for the maintenance and protection of most animal species. Hydrogen-ion concentrations (pH), are a measure of relative acidity of the water. A pH between 6.5 and 8.5 is believed to afford a maximum level of protection for living species.

Maryland waters are divided into four classes, as indicated in Appendix H. The creeks of Greenbelt fall into the first class. Standards for these waters in Maryland stipulate that turbidity average no more than 50, as measured by a Jackson candle turbidometer, monthly and not exceed 150. Fecal coliforms are not to exceed an average of 200/100 milliliter of sample. DO may range on a daily basis from 4.0 to 5.0 milligrams (mg) per liter. pH may range from a minimum of 6.5 to a maximum of 8.5. An elevation in temperature no greater than $5^{\circ}F$ is permissible.

The closest sampling station to Greenbelt Park is located on Greenbelt Road at Indian Creek. Results of this sampling are given in Appendix H. From 1973-1976 water temperatures ranged from $.3^{\circ}C$ in December to $27.0^{\circ}C$ in August. Dissolved oxygen ranged from 6.0 milligrams per liter in April to 15.0 milligrams per liter in February and March. pH ranged from 5.4, which is slightly acidic, in January to 7.6, which is approximately neutral, in September. Fecal coliform counts ranged from 43/100 milliliters in December to 210,000/100 milliliters in August.

In October of 1975, 14 micrograms of arsenic per liter were found at this station. Additional water quality parameters measured for this station included turbidity which averaged 40.36 for 306 samples taken between 1973 and 1975. During October, November, and December 1975, arsenic in amounts ranging from 14 to 6 micrograms per liter was found in samples analyzed.

An additional significant water quality parameter analyzed for this station included biochemical oxygen demand (BOD). A BOD value greater than 5 milligrams per liter indicates water polluted with organic waste. The average BOD value for 12 samples was 4.5.

County facilities for the treatment of waste-water are described in Appendix H.

Air pollutants in the Greenbelt Park area orginate from homes, factories, and industrial development, but the primary source is exhaust gases from the operation of motor vehicles. The Park is bordered on all sides by major arterial highways. These substances include hydrocarbons, carbon monoxide, nitrogen dioxide, and related photochemical oxidants.

These pollutants -- particulate matter, hydrocarbons, and carbon monoxide (CO) -- are measured at a monitoring station at the Hyattsville Library and another at Prince George's Plaza. Particulate matter, composed primarily of dust and fuel residue, is caused by construction activities, unburned heating fuels, and the movement of vehicles. Hydrocarbons are formed from unburned gasoline, from fumes that escape when vehicles are being fueled, and from heating fuels.

A remote source of air pollutants in the Greenbelt area, which pass through or stagnate in valleys within the Park is the Washington, D.C. metropolitan area. Pollutants generated in Washington by the large number and concentration of cars and trucks, by construction activities and by the widespread use of low-grade heating fuels. These pollutants are carried to the Park by the prevailing southwesterly winds. A map showing the relative concentration and distribution of particulate matter is included in Appendix H.

In accordance with the provisions of the Clean Air Act, the Federal EPA has established "National Ambient Air Quality Standards". Two types of standards have been promulgated: "primary" standards, which protect the public health; and "secondary" standards, which protect against effects on soil, vegetation, and visibility, etc. In the case of CO, the primary and secondary standards are identical. The CO standards are expressed in terms of duration of specific CO concentrations, since the adverse health effects of CO are related to both the concentration and the length of exposure. These standards are given below:

Maximum 8-Hour Concentration 9 parts per million (ppm)

Maximum 1-Hour Concentration 35 parts per million (ppm)

These levels are not to be exceeded more than once per year.

The State of Maryland has also adopted ambient air quality standards. These standards are listed and compared with the Federal standards in Appendix H.

The national primary and secondary standards for particulate matter were not exceeded at any Prince George's County station in 1975.

CO is a colorless, odorless, tasteless gas which results largely from fuel combustion lacking sufficient oxygen. Because short-term level exposures to CO are most critical, the standards for CO are expressed in terms of maximum one- and eight-hour averages. No Prince George's County stations exceeded the national primary and secondary standards for CO at stations sampled near the Park for 1975.

Photochemical oxidants, also called photochemical smog, are not emitted directly into the atmosphere, but are formed by hydrocarbons and nitrogen dioxides in the presence of sunlight. Since hydrocarbons and nitrogen oxides result primarily from automotive emissions, they are most prevalent during the morning rush hours from 6 to 9 a.m. Every monitoring station in the region is currently in excess of the national standard. The Maryland Environmental Health Administration has estimated that hydrocarbon emissions in Prince George's County would have to be reduced to a maximum of 10.5 tons daily per peak period to bring photochemical oxidant levels to below maximum standards.

Sulfur dioxide (SO_2) is a heavy, pungent, colorless gas formed primarily by combustion of coal, oil, and other sulfur-bearing compounds. SO_2 emissions result primarily from fuel combustion in power plants, businesses and industry. Sulfur dioxide levels for 1973 are presented in Appendix H. From 1973-1975 no monitoring stations registered SO_2 levels above national standards.

Nitrogen dioxide (NO_2) is formed when fuels are burned at high temperatures within air. Power plants and autos are the two principal sources of this gas. Only one station in Prince George's County showed a reading above the national standards in 1975.

Since 1971, the levels of air pollutants caused by stationary sources (particulate matter and sulfur dioxide) have decreased in Prince George's County. This decrease is due to enforcement of emission regulations by state and local agencies within the Washington metropolitan region. Analysis performed by the Council of governments indicate that these levels will rise slowly due to regional growth and development. Neither of these pollutants is likely to exceed primary or secondary standards within Prince George's County over the next twenty years.

Noise levels are presented in terms of dBA L_{10}, which is the noise unit prescribed by the FHWA. "db" refers to decibel. A change of 3 decibels is about the smallest charge that can be discerned by the human ear, without the help of instruments. "A" is a weighting factor that deemphasizes the low and very high-pitched components of noise, as does the human ear. Noise measured in dBA correlates with subjective personal impressions of loudness and annoyance. "L_{10}" takes into account the moment-to-moment fluctuations of noise. Generally, a change of at least five decibels is required to cause significant change in the noise level of a community. A ten-decibel increase is usually perceived as a doubling in loudness. Examples of noise levels in Greenbelt Park are given in Appendix H and on the Noise Projections Map on page 109).

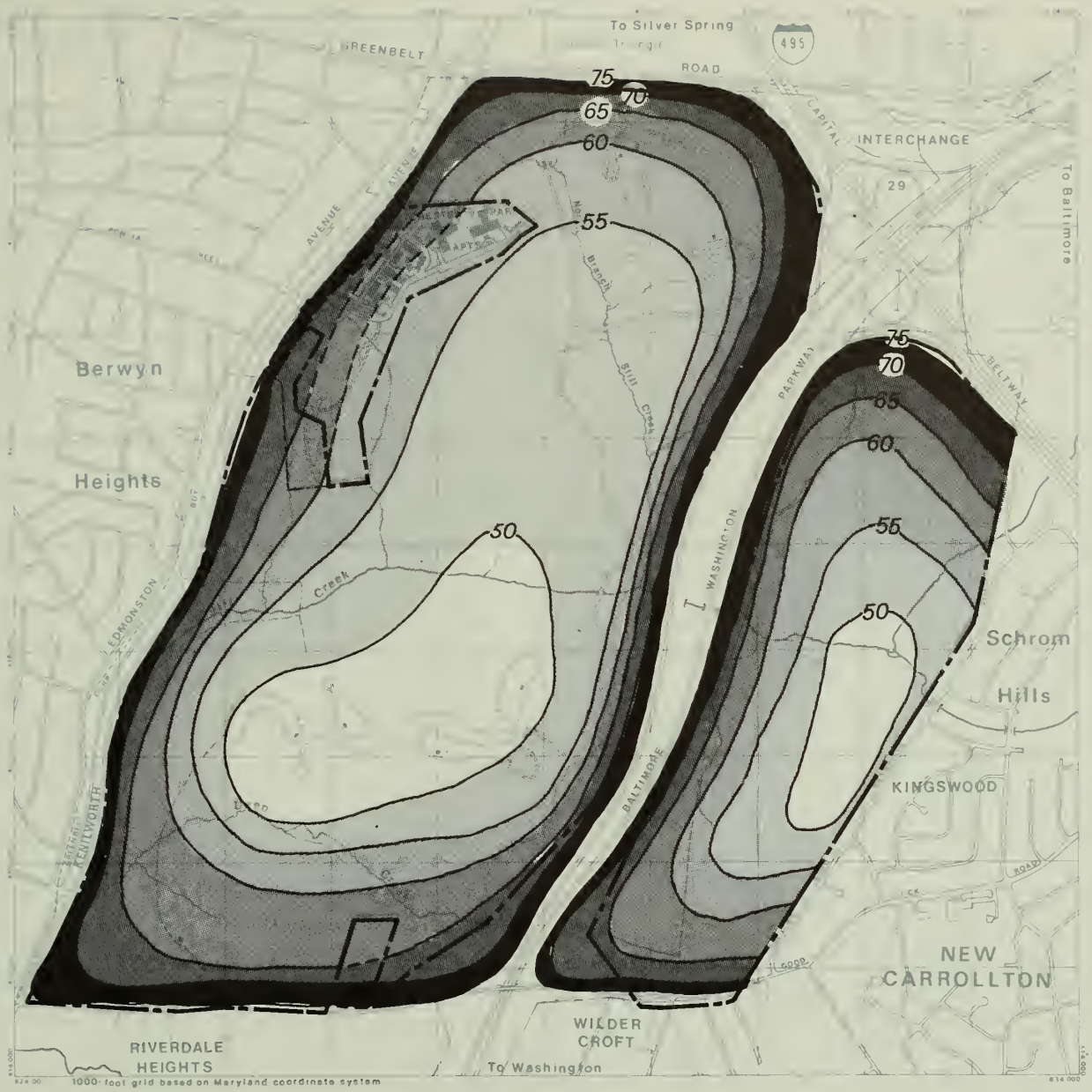
Measured 1979 noise levels for the Baltimore-Washington Parkway, which separates the eastern and western parts of the Park, were approximately 70 decibels. Projected 1995 noise levels for the Parkway range from 76 to 81dBA at 50 feet. Autos travelling at slower speeds on Greenbelt Road (Maryland Route 193), which borders the northern end of the park, and on Kenilworth Avenue (Maryland Route 201), which borders the western edge of the park, average 65 dBA. Noise levels on Good Luck Road, which is a two-lane highway, are slightly less.

Traffic noise can be heard throughout the park. The effect of tree shielding 700 feet from the Parkway is estimated to be 10 decibels. The noise level at the campsite at the interior of the park is approximately 50 dBA.

The average daily traffic levels (ADT) for the thoroughfares bordering Greenbelt Park, as measured from October 1, 1976 through September 30, 1977 are also presented in Appendix H. They range from 105,000 vehicles (Capital Beltway between the Baltimore-Washington Parkway and Kenilworth Avenue interchanges) to 17,990 vehicles (Good Luck Road along the southern boundary of the East Park).

ADT on Kenilworth Avenue between the Greenbelt Road and Capital Beltway Interchanges was 38,500 and between Good Luck and Greenbelt Roads 25,200 vehicles. Beyond the Beltway interchange, northwest of the Golden Triangle, levels dropped to 18,300 vehicles. That part of the Baltimore-Washington Parkway passing through

Greenbelt Park carried an ADT of 48,800 vehicles. Good Luck Road, as it paralleled the southern boundary of the West Park had an ADT of 15,280 vehicles, whereas Greenbelt Road, opposite the main Park entrance carried an ADT of 26,900 vehicles. It is anticipated that, with the completion of the Golden Triangle development and the completion of the proposed modification of the Greenbelt Road-Kenilworth Avenue intersection these levels may increase by 10 - 12%.



Noise levels in decibels.

	0	**Threshold of hearing**	Private business office	**50**	**Quiet**
Rustling leaves in breeze	**10**	**Barely audible**	Light traffic(50 ft.)	55	
Broadcast studio	20		Accounting office	60	
Soft whisper(15 ft.)	**30**	**Very quiet**	Conversation(3 ft.)	**65**	**Intrusive**
Library	35		Freeway traffic(50 ft.)	70	
Bedroom in home	40		Freight train(50 ft.)	75	
Living room at home	45		Noisy office with machines	**80**	**Annoying**

N

500 0 500 1000 1500 2000 Feet

200 100 0 200 400 600 Meters

NOISE PROJECTIONS

GREENBELT PARK

MARYLAND

UNITED STATES DEPARTMENT OF THE INTERIOR / NATIONAL PARK SERVICE

843 | 40.017

DSC | JUNE '80

BIOLOGICAL ENVIRONMENT

BIOLOGICAL ENVIRONMENT

VEGETATION

Greenbelt Park is a woodland of low, rolling hills. Swampy areas occur along two small tributary streams. Trees are primarily pines and oaks with a well-developed understory of herbs and shrubs. Black gum, sweet gum, hickory, yellow poplar, sassafras, and red maple are common. Arrowwood, laurel, holly, poison ivy, greenbrier, and Japanese honeysuckle are found in the understory. Laurel is very abundant. Bracken fern is found in dry openings, and the forest supports interesting species of partridgeberry, ladyslipper, and ground pine. A partial list of plant species is given in Appendix I.

Before the area that is now Greenbelt Park was settled by colonists, it was largely covered by hardwood forests. The dominant trees were probably red and white oaks, sweetgum and yellow poplar. Settlers cleared and cultivated primarily tobacco on these lands up to the early 1930s when poor agricultural practices had rendered them unsuitable for farming. Cleared and cut-over areas frequently eroded into steep ravines. Conifers, primarily Virginia pine, have since invaded the land (especially sandy areas) to be, in turn, shaded out by mixed deciduous forest, characterized primarily by oaks (especially black oak), maples, and hickory.

Because of the aquaclude nature of the Patapsco Geologic Formation, which underlies most of the park, and the relative impermeability of most park soils, these forests are interspersed with wet meadows.

A rare and unusual plant fossil, Cycadoidea marylandica is found in all streams of the park. Cycad fossils are rarer than those of many other plants. The original distribution of this fossil was very limited. Its range is thought to extend over 56.7 kilometers from College Park to a point 12.1 kilometers northeast of Baltimore. The width of this range was 13.3 kilometers and extended from tide level to 91.4 meters and included portions of the present Baltimore and Washington Parkway and the Town of Greenbelt, Maryland. Less than 200 pieces of this cycad have been recovered, including a petrified trunk fragment in Greenbelt Park, which lies in the southern limit of the range.

Additional unusual natural features of Greenbelt Park include an area of poison sumac, which is rare in wetlands of this region. The species is locally abundant in Greenbelt Park. Its distribution is influenced by fluctuations in or disruption of the water table. Additional uncommon plants found in the park include sweetbay magnolia, checkerberry, wintergreen, and groundpine.

Natural areas of interest within the park include patches of ground cedar, haircap moss, striped pipsissewa, and stands of willow oak and cinnamon fern in wet meadows in the 284-acre tract. In that portion of the park, situated west of the Parkway, natural areas of interest include several mountain laurel thickets, a patch of lady-slippers, and a peat bog. Swampy areas are characterized by fragile vegetative communities, which include skunk cabbage, the earliest blooming park plant. Sweet-bay magnolia and rattlesnake plantain are also found in the Park, as well as large areas of ground pine.

Major vegetative groupings within the park include upland pine forest, upland oak-pine forest, upland oak-hickory forest, bottomland hardwood forest, upland maple forest, wet meadows, wetlands, bog, floodplain forest, river-birch swamp, old field, burn areas, eroding upland, parkland and stream communities (Vegetation Map, page 117).

Upland Pine Forest

Almost pure stands of Virginia pine are found along upland road edges, where the hardwood canopy cannot shade out pine seedlings and soil drainage is good. Such stands, which include some pitch pine, are also found on dry upland areas throughout the park, where clearing of hardwoods provides sufficient light and soil is dry enough to support a pine edge.

Upland Oak-Pine Forest

Areas of mixed oak forest composed of scarlet, white, willow and chestnut oak interspersed with tall pitch and Virginia pines, extending above the hardwood canopy, form the major upland vegetative community of the park. Hickory is also dominant in this community. Understory trees include viburnum, dogwood, and mountain laurel. The herbaceous layer is limited in this community by the heavy canopy and drier soils. Common exotics include Japanese honeysuckle and tree of heaven.

Upland Oak-Hickory Forest

This climax community is dominated by scarlet, white and chestnut oak as well as hickory, primarily pignut hickory. Other tree species common in this community are black gum, beech, and maple.

Bottomland Hardwood Forest

This vegetative community is found in the fertile, moist soils in ravines. Sweetgum and black gum are the dominant trees. Viburnum is common in the understory. Greenbriar, clubmoss and varieties of ferns are typical ground species.

Upland Maple Forest

This plant community, dominated by red maple, is found in belts behind the Virginia pine community in moist uplands and along road perimeters not bordered by pine. Trees of this community are early growth and secondary succession vegetation.

Wet Meadows

Upland communities in open areas are characterized by grasses, ferns, mosses and holly; a moist soil; and are frequently surrounded by mixed deciduous forests. Such areas result from the impermeability of the substrate, which prevents proper drainage of water.

Wetlands

The major wetlands in the park are found on the floodplains of streams and in periodically inundated areas extending alongside streams. Plants growing here include ferns, mosses and bog plants such as jack-in-the-pulpit and skunk cabbage. Ladyslippers,ground cedar, striped pipsissewa and groundpine, sycamore, boxelder, ash, willow and spicebush are found here.

Bogs

These include areas in which water, seeping from the hillside, collects in natural depressions. Growing conditions here favor not only ferns and mosses, but also clubmosses and sweetbay magnolia, both evergreens.

Floodplain Forest

This association occurs along the streams of the park and included red maple, ash, willow, willow oak and spicebush. In spring, this forest floor is rich in wildflowers.

River-Birch Swamp

This swamp is found in the 284-acre tract extending alongside Still Creek adjoining the Kingswood subdivision. It consists of a river birch primary succession forest invading an area cleared for a sewer line. Other trees found in this swamp include sycamore, red maple and willow.

Old Field

Grassy field undergoing primary succession by Virginia pine and scrub oak.

Burn Areas

There have been approximately 25 fires in the past ten years. Most of them occurred along trails used by school children and nearby residents in the southwest section of the park. The largest fire in 1959, covered about nine acres in this same section of the park. The vegetative community created by fire consists of bare areas of enriched soils on which the primary succession is grasses and weeds, usually followed by Virginia pine and scrub oak. A large burn occurred near campsite C-20 and is now included in the Environmental Study Area.

Eroding Upland

Construction activity on this site, also called the Jaeger Tract, have resulted in sheet erosion leaving a primarily coarse sand and gravel surface. Vegetation is limited to hardy plants such as scrub oak, pine and blueberries.

Parkland

Parkland is an area in which natural succession is prevented by continual maintenance by man. It consists primarily of mowed grass and sparse clumps of indigenous or ornamental vegetation.

Streams

Deep and Still Creeks, as well as several intermittent streams, are largely devoid of vegetation, partially because of erratic fluctuations in width and depth and excessive sediment loading from upstream development. Growth of phytoplankton is limited by excessive turbidity. Fish found in these waters are primarily carp and pollution-tolerant minnows.

WILDLIFE

The diversity and abundance, of the wildlife, which at one time inhabited this area, have been decreased by the urban development of areas contiguous to the park. Populations of white-tailed deer were present until a few years ago. A partial list of common species found in Greenbelt Park is included in Appendix I.

The animal population has never been well surveyed but predominant mammalian species include rabbits, gray squirrels, flying squirrels, and opossums. The most common birds are the tufted titmouse, bluejay, chickadee, cardinal, and various sparrows. The Park provides a haven in a heavily urbanized area for large numbers of migratory birds, especially warblers.

No threatened or endangered species of animal is known to exist in Greenbelt Park.

1. Upland pine forest
2. Upland oak-pine forest
3. Upland oak-hickory forest
4. Upland maple forest
5. Bottomland hardwood forest
6. Wet meadow
7. Wetland
8. Bog
9. Floodplain forest
10. River-birch swamp
11. Old field
12. Burn area
13. Eroding upland
14. Parkland
15. Stream

SOURCE:

Vegetation was determined from aerial infrared and natural color photography, and on site surveys by L.Rummel - July 1979.

N

500 0 500 1000 1500 2000 Feet

200 100 0 200 400 600 Meters

VEGETATION

GREENBELT PARK

MARYLAND

UNITED STATES DEPARTMENT OF THE INTERIOR / NATIONAL PARK SERVICE

843 | 40,015
DSC | JUNE '80

APPENDICES

APPENDIX A:

LEGISLATION

Private Law 87-596
87th Congress, H. R. 11551
October 9, 1962

An Act

To authorize the Secretary of the Interior to convey certain lands in the State of Maryland to the Holy Cross Lutheran Church, Greenbelt, Maryland, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Secretary of the Interior may convey to the Holy Cross Lutheran Church, Greenbelt, Maryland, upon payment of fair market value, all right, title, and interest of the United States of America in and to a parcel of land situated in Prince Georges County, Maryland, described as follows:

Beginning at the intersection of the proposed easements for the recently reconstructed Branchville-Greenbelt Road and the Capital Beltway now under construction; thence in an easterly direction along the proposed easement for the Branchville-Greenbelt Road, approximately as shown on construction plans P722-46-320 of the Maryland State Roads Commission and filed among the land records of region 6 of the National Park Service (map file numbered NCP122-335-1 through 27), to its intersection with fourth line of a 30-foot right-of-way extending from the Branchville-Greenbelt Road to the property now or formerly owned by Elinor M. Jones, as described in a deed executed for the United States by John Taylor Egan, Commissioner of Public Housing Administration, dated February 8, 1949, and recorded among the land records of Prince Georges County, Maryland, in liber 1302, folio 76;

thence with the above-mentioned fourth line south 4 degrees 17 minutes west to the end thereof; thence with the fifth line south 22 degrees 09 minutes west 152.35 feet to the end thereof at a point in the eighth line of the above-mentioned Jones property; thence with the remainder of the eighth line reversed north 76 degrees 49 minutes 50 seconds west 975.86 feet; thence with the seventh, sixth, fifth, and fourth lines of the Jones property reversed south 53 degrees 24 minutes 20 seconds east 105.82 feet, south 68 degrees 07 minutes 20 seconds east 85.25 feet, south 76 degrees 08 minutes 20 seconds east 131.70 feet, south 8 degrees 55 minutes 20 seconds east 269.91 feet, thence south 36 degrees 12 minutes 00 seconds west with a portion of the third line of the Jones property reversed to its intersection with the proposed easement for the westbound ramp from the Baltimore-Washington Parkway to Capital Beltway;

thence in a westerly direction with the proposed easement, curving in a northwesterly direction where the ramp merges with the Capital Beltway and continuing in a northwesterly direction, approximately as shown on construction plans P722-13-320 of the Maryland State Roads Commission and filed among the land records of region 6 of the National Park Service (map file numbered NCP125-335-1 and 2), to the place of beginning; containing approximately 12 acres of land more or less, as shown on a plat compiled by region 6 of the National Park Service, United States Department of the Interior, from construction plans for the Baltimore-Washington Parkway, the Branchville-Greenbelt

Road, and the Capital Beltway, and bearing map file numbered NCPBS-421. The exact boundaries of the area shall be prescribed by the Secretary of the Interior after final determination has been made of proposed locations for highway construction to the Maryland State Roads Commission.

Approved October 9, 1962.

[PUBLIC LAW 643—81ST CONGRESS]

[CHAPTER 525—2D SESSION]

[H. R. 5990]

AN ACT

To provide for the construction, development, administration, and maintenance of the Baltimore-Washington Parkway in the State of Maryland and its extension into the District of Columbia as a part of the park system of the District of Columbia and its environs by the Secretary of the Interior, and other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That all lands and easements heretofore or hereafter acquired by the United States for the right-of-way for the parkway which is being constructed by the Bureau of Public Roads between Anacostia Park in the District of Columbia and the northern boundary of Fort Meade in the State of Maryland, the extension of said parkway into the District of Columbia over park lands to the intersection of New York Avenue extended with the boundary of Anacostia Park, and including any lands required for additional connections to the Maryland road system all of which shall be regarded as an extension of the park system of the District of Columbia and its environs, to be known as the Baltimore-Washington Parkway and it shall be constructed, developed, administered, and maintained by the Secretary of the Interior, through the National Park Service, subject to the provisions of the Act of Congress approved August 25, 1916 (39 Stat. 535), the provisions of which Act, as amended and supplemented, are hereby extended over and made applicable to said parkway, insofar as they are not inconsistent with the provisions of this Act.

SEC. 2. The parkway shall be constructed, developed, operated, and administered as a limited access road primarily to provide a protected, safe, and suitable approach for passenger-vehicle traffic to the National Capital and for an additional means of access between the several Federal establishments adjacent thereto and the seat of government in the District of Columbia. To avoid impairment of this purpose, the Secretary of the Interior, with the concurrence of the Secretary of Commerce, shall control the location, limit the number of access points, and regulate the use of said parkway by various classes or types of vehicles or traffic.

SEC. 3. The Secretary of the Interior in his administration of this parkway is authorized, in his discretion, to accept from private owners, State and local governments, lands, rights-of-way over lands, or other interests in lands adjacent to such parkway, and also to accept the transfer of jurisdiction to the Department of the Interior of adjacent lands for park and recreational purposes from any Federal agency or department, without reimbursement to such Federal agency or department having jurisdiction thereof, when such transfer is mutually agreed upon by the Secretary and such department or agency; and such transfer of jurisdiction by any such department or agency

of the Federal Government in possession of such lands is hereby authorized. Notwithstanding the provisions of any other law, the lands required for said parkway within the suburban resettlement project known as Greenbelt, Maryland, as surveyed by the Bureau of Public Roads and shown on plats AOV–WBP–3 and AOV–WBP–4 prepared by said Bureau and dated July 10, 1946, and within the Agricultural Research Center at Beltsville, Maryland, as surveyed by the Bureau of Public Roads and shown on plat SOM–WB–10 prepared by said Bureau and dated June 22, 1944, are hereby transferred, without reimbursement, to the administrative jurisdiction and control of the Department of the Interior, for the purposes of this Act, subject to such terms and conditions as may be agreed upon by the Public Housing Administration and the Department of Agriculture, respectively, with the Department of the Interior and the Bureau of Public Roads.

SEC. 4. The Secretary of the Interior is hereby authorized to accept, on behalf of the United States, title to any lands, rights-of-way, or easements over lands owned by the State of Maryland which may be offered by the Governor of Maryland for the proper development and administration of the Baltimore-Washington Parkway in accordance with the provisions of the laws of Maryland, chapter 644, approved May 6, 1943, and subject to such conditions respecting control and jurisdiction as may be mutually agreed upon by the designated agencies of the United States and the State of Maryland whenever such conveyance may affect any park lands acquired under the provisions of the Act of Congress, May 29, 1930 (46 Stat. 482).

SEC. 5. Except as provided in section 6, the money appropriated for parkways administered by the National Park Service by the Department of the Interior Appropriation Act each fiscal year shall be available for expenditure for continuing the construction, development, maintenance, and policing of the Baltimore-Washington Parkway.

SEC. 6. The cost of construction of the parkway shall not exceed the additional sum of $13,000,000.

Approved August 3, 1950.

AGREEMENT

BALTIMORE-WASHINGTON PARKWAY

THIS AGREEMENT, by and between the Secretary of Transportation, acting by and through the Federal Highway Administrator; the Secretary of the Interior, acting by and through the Director, National Park Service; and the Maryland Department of Transportation, acting by and through the State Highway Administrator;

W I T N E S S E T H

WHEREAS, Subsection (a) of Section 146 of the Federal-Aid Highway Act of 1970, Public Law 91-605, approved December 31, 1970 (84 Stat. 1739), (hereinafter referred to as the "ACT"), authorizes to be appropriated to the Secretary of Transportation, out of the Highway Trust Fund, not to exceed $65,000,000 for reconstruction to six lanes the section of the Baltimore-Washington Parkway in the State of Maryland under the jurisdiction of the Secretary of the Interior to the geometric and construction standards for the National System of Interstate and Defense Highways; and

WHEREAS, Subsection (b) of Section 145 of the ACT provides that no funds authorized by this section shall be expended until the Secretary of Transportation, the Secretary of the Interior, and the State highway Department of the State of Maryland shall enter into an agreement containing the provisions specified in such Subsection;

NOW, THEREFORE,

A. The parties hereto agree, in conformity with the provisions of Subsection (b) of Section 140 of the ACT, that:

(1) upon completion of reconstruction of the section of the Baltimore-Washington Parkway, as provided in Subsection (a) of Section 146 of the ACT, the Secretary of the Interior will convey without monetary consideration such section of such Parkway to the State of Maryland; and

(2) the State of Maryland shall put such section of the Parkway on the Federal-aid primary system prior to expenditure of funds authorized by this section, and for such purpose the mileage limitation on such system in such State imposed by Section 103(b) of Title 23, United States Code, is hereby waived, and such State shall thereafter retain such section on such system.

B. The Federal Highway Administrator and the State Highway Administrator of Maryland agree that all work involved in the reconstruction of such section of the Parkway to interstate standards, as provided in Section 146 of the Act, consisting of preliminary engineering, acquisition of right-of-way, preparation of plans, specifications, and estimates, and construction including maintenance activities accomplished as part of the construction contracts shall be undertaken and completed by the State Highway Administration of Maryland, or under its direct supervision, subject to the requirements of Federal law and applicable procedures for the construction of projects financed from Federal-aid highway

funds under Title 23, United States Code, except as otherwise provided in Section 146 of the ACT; and that the State Highway Administration of Maryland shall be reimbursed by the Federal Highway Administration for all costs of such reconstruction, including, but not limited to, administration and overhead, to be paid from sums appropriated by Congress for such purposes.

C. The scheduling of the work and further implementing details in carrying out above paragraph B shall be mutually agreed upon between the Federal Highway Administration and the State Highway Administration of Maryland.

D. All parties to this agreement declare it to be their intention, pursuant to existing Federal Legislation and the availability of appropriated funds, to pursue the reconstruction of the parkway expeditiously with the intention of completion of the entire Federal section within 48 months from the date of the award of the first construction contract.

E. The Federal Highway Administration and the State Highway Administration of Maryland mutually agree that all construction contracts shall include provisions for the maintenance of that segment of the reconstructed Federal section until such time as the title to that segment is conveyed to the State of Maryland.

F. The National Park Service shall be responsible for the maintenance of the Federal section of the Parkway until the aforementioned construction and maintenance contracts are awarded, and at that time the maintenance responsibility of the National Park Service for that segment of the Parkway shall terminate.

G. The National Park Service shall police all of the Federal section of the Parkway until such time as all or part of the Federal section is conveyed to the State of Maryland, and at that time, police responsibility of the National Park Service for that segment of the Parkway shall terminate.

H. The State Highway Administrator of Maryland and the Director, National Park Service, hereby agree that permits for the use of the parklands will be issued by the National Park Service to the State Highway Administration for each of the construction contracts awarded by it for the reconstruction work authorized in Section 146 of the Act. Such permits shall set forth requirements for safety measures within the Federal section, and appropriate provisions for orderly traffic flow and control which shall be included in the plans and specifications for each and every contract.

I. It is further agreed that, upon completion of the reconstruction of a substantial segment of the total Federal section of the Parkway, that segment may then be conveyed to the State of Maryland upon agreement by the State Highway Administration of Maryland.

J. The State Highway Administrator of Maryland and the Director, National Park Service, agree that all right, title and interest of the United States in the portion of the Suitland Parkway now under the administration of the National

Park Service within the State of Maryland will be transferred to the State of Maryland subject to the following conditions:

1. Enactment of legislation to authorize such transfer.

2. Enactment of legislation authorizing funds for construction and reconstruction of the Suitland Parkway.

3. Concurrence by the State Highway Administrator in the nature, extent, and standards of construction and reconstruction to be accomplished.

IN WITNESS WHEREOF, the parties hereunto have caused this agreement to be executed, effective as of this 9th day of June, 1972.

U. S. DEPARTMENT OF TRANSPORTATION
Federal Highway Administration

By: _____
F. C. Turner
Federal Highway Administrator

U. S. DEPARTMENT OF THE INTERIOR
National Park Service

By: _____
Raymond L. Freeman
Acting Director, National Park Service

MARYLAND DEPARTMENT OF TRANSPORTATION
State Highway Administration

By: _____
David H. Fisher
State Highway Administrator

NATIONAL PARK SERVICE
NATIONAL CAPITAL REGION

Land Record No. 736 May 10, 1977

Baltimore-Washington Parkway
Greenbelt Park
Prince Georges County, Maryland

1. On May 10, 1977, the following acquisition was recorded in the Land Records of National Capital Region as a part of the Park System of the Nation's Capital.

Part of Parcel "C" as shown on plat of subdivision recorded in the Land Records of Prince Georges County, Maryland, Plat book WWW 56, as plat number 88. The property conveyed will become a part of Greenbelt Park, Maryland.

AREA: 18.8624 acres

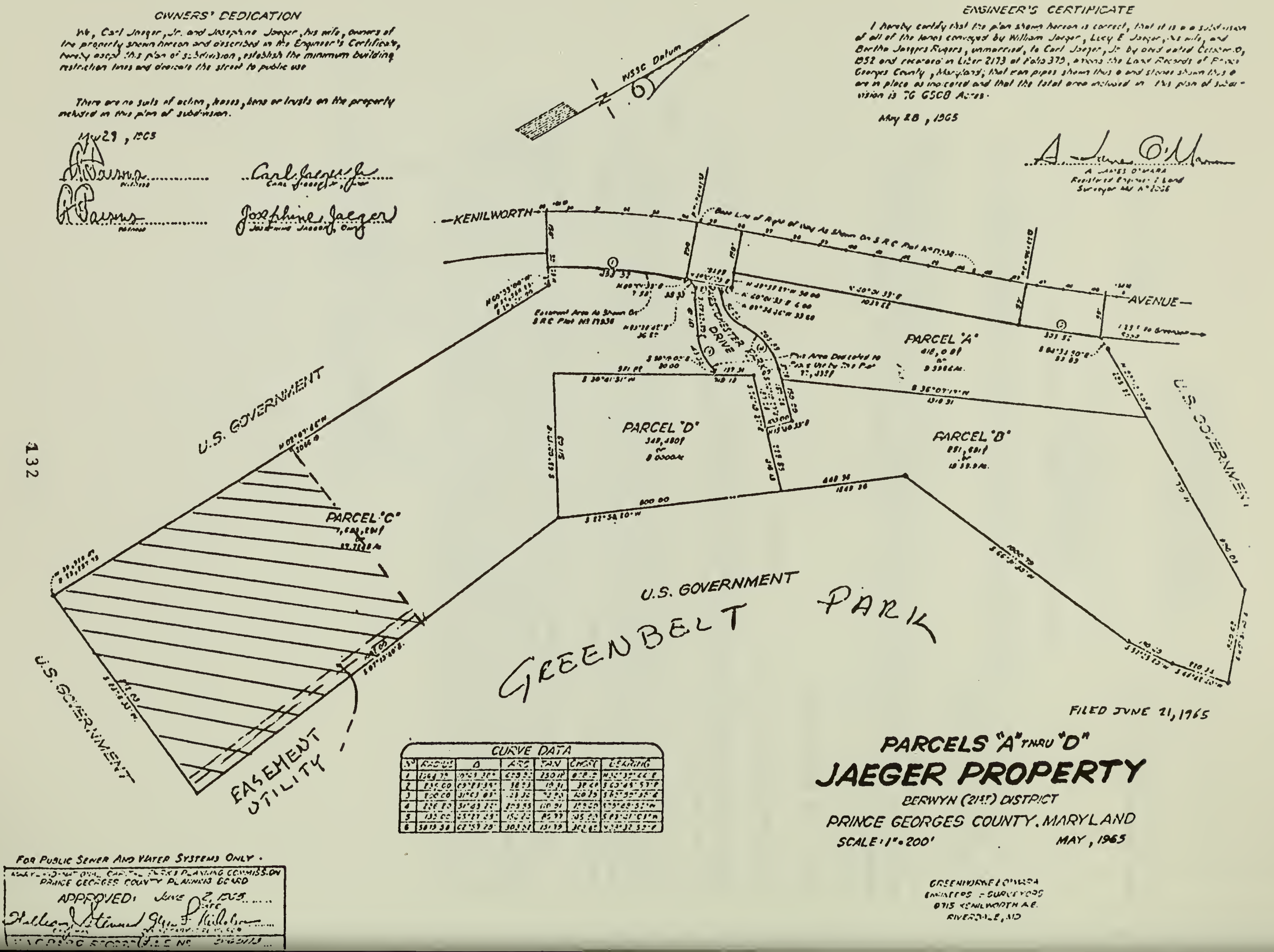
Plat assigned Map File No. 842/80,007

Deed to the United States recorded on January 24, 1977, Land Records of Prince Georges County, Maryland. Liber 4719, folio 50.

This conveyance is authorized under Public Law 643, approved August 3, 1950 (64 Stat. 400) which provided for the construction of the Baltimore-Washington Parkway and authorized the Secretary of the Interior to accept donations of lands adjacent to the parkway for recreational purposes.

2. This land was conveyed to the National Park Foundation by deed dated December 6, 1976 from Frances Saul, II; George Revitz; Raymond Greenberg; Jerome E. Korpeck; Carl Yeager, Jr.; and William J. Gay, to become a part of the Park System of the Nation's Capital. On December 27, 1976, the National Park Foundation conveyed the tract of land to the United States of America to be under the jurisdiction of the National Park Service.

Manus J. Fish Jr.
Regional Director, National Capital Region


OWNERS' DEDICATION
There are no suits of action, leases, liens or trusts on the property included in this plan of subdivision.
ENGINEER'S CERTIFICATE
May 28, 1965
KENILWORTH
AVENUE
PARCEL "A"
PARCEL "B"
PARCEL "C"
PARCEL "D"
U.S. GOVERNMENT
GREENBELT PARK
EASEMENT
UTILITY
CURVE DATA
FILED JUNE 21, 1965
PARCELS "A" THRU "D"
JAEGER PROPERTY
BERWYN (21ST) DISTRICT
PRINCE GEORGES COUNTY, MARYLAND
SCALE: 1" = 200'
MAY, 1965
FOR PUBLIC SEWER AND WATER SYSTEMS ONLY.
APPROVED:

United States Department of the Interior

NATIONAL PARK SERVICE
NATIONAL CAPITAL REGION
1100 OHIO DRIVE, S. W.
WASHINGTON, D.C. 20242

In reply refer to:
L14-NCR(LUCE)

1980 JAN 31

Sheldon J. Weisel, Esquire
Shaw, Pittman, Potts & Trowbridge
1800 M Street, NW.
Washington, D.C. 20036

Dear Mr. Weisel:

The National Park Service is pleased to accept the generous donation of approximately 9.4 acres of land adjoining Greenbelt Park, Maryland, from B. Francis Saul II, George Revitz, Raymond Greenberg, Jerome E. Korpeck, William J. Gay, and B. Francis Saul II and Suburban Trust Company, Trustees under a Trust established by Carl Jaeger, Jr.

The donated lands will become a part of Greenbelt Park, a unit of National Capital Region, National Park Service. It is intended that the lands will be used perpetually for park purposes, and, in fact, parklands administered by the National Park Service are not subject to disposal under existing law except to the extent that the exchange authority conferred by the Land and Water Conservation Fund Act is applicable. Such exchanges provide for lands of equal value for park purposes. It is not intended, however, that the donated land will be disposed of.

We are in the process of preparing a Development Concept/General Management Plan for the park and assure you that the lands conveyed will be included in the document. As part of the planning process an environmental assessment is also being prepared and will be available for public review and comment in March. We will be pleased to provide the donors a copy at that time.

The plan will be the subject of a thorough review under the provisions of the National Environmental Policy Act of 1969.

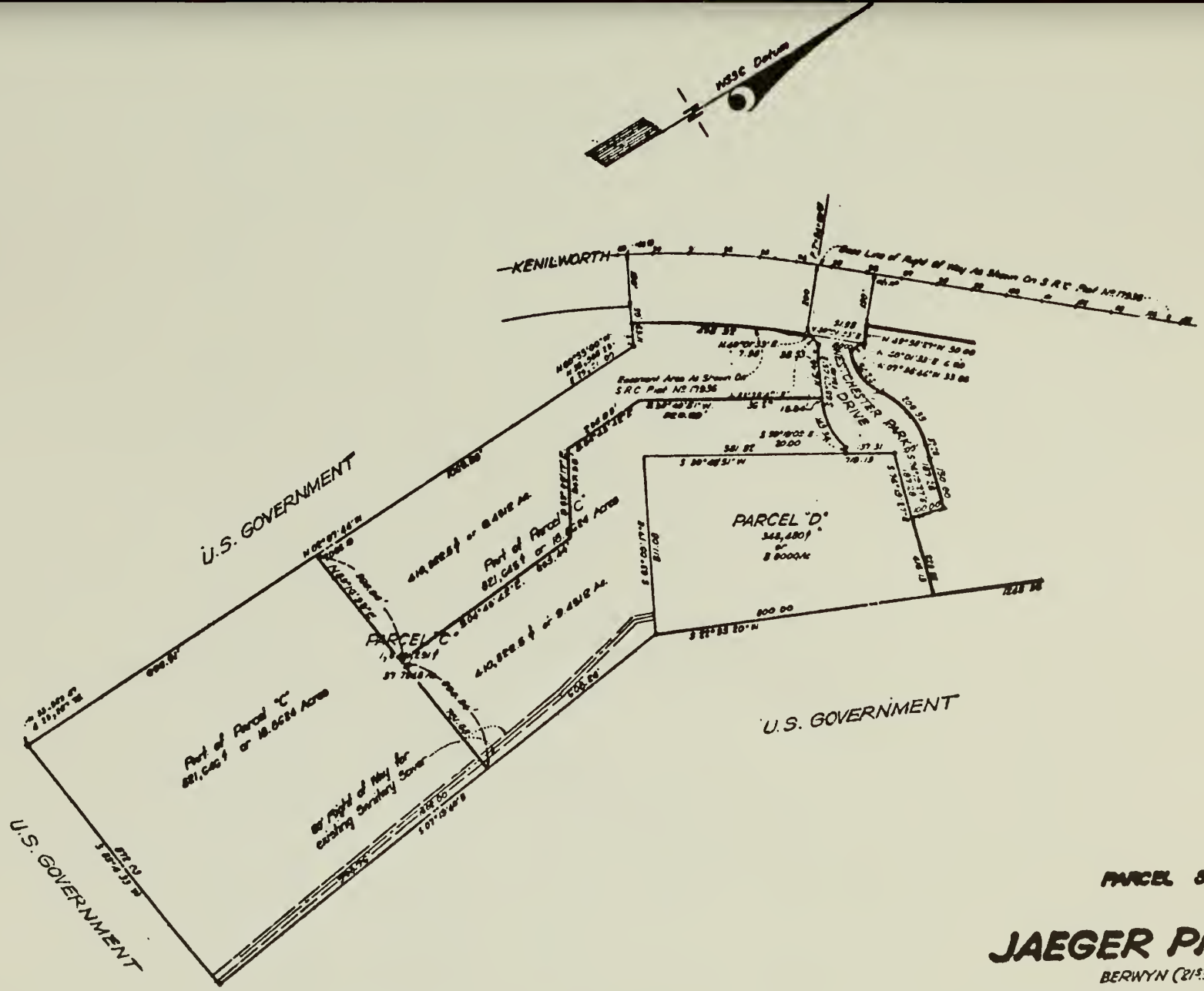
As to the existing statutes authorizing the acquisition of the land by gift for addition to present parklands, be advised that Public Law 643, approved August 3, 1950 (64 Stat. 400), authorizes the acquisition of this property since the property is adjacent to lands already included in the Baltimore-Washington Parkway.

We appreciate the opportunity of accepting this most generous donation of lands to be a part of the Park System of the Nation's Capital.

Sincerely yours,

/s/ Robert G. Stanton

Acting Director
National Capital Region



PARCEL SEPARATION

JAEGER PROPERTY

BERWYN (21st) DISTRICT

PRINCE GEORGES COUNTY, MARYLAND

SCALE: NONE DECEMBER 1979

GREENHORNE & O'HARA
ENGINEERS + SURVEYORS
6719 KENILWORTH AVE
RIVERDALE, MD

APPENDIX B:

STATEMENT FOR MANAGEMENT

STATEMENT FOR MANAGEMENT

GREENBELT PARK

I. PURPOSE OF THE PARK

1. Recreational

The continuing purpose of Greenbelt Park is to serve as a regional park for residents of the National Capital area, providing a program of day-use recreation, picnicking and interpretation and to provide overnight camping facilities to meet the needs of individuals, families and groups visiting the Nation's Capital. Also, to preserve the area's remaining natural resources so that visitors may enjoy recreational experiences in a natural and pleasant environment.

2. Environmental

Greenbelt Park is a prime example of nature at work healing the scars and depredation of generations of overuse of the land and its resources. An environmental education trail system was established to project this recovery program in conjunction with local schools and universities. Because of the Park's location in a high density urban society, continued diligent preservation must be maintained in order to protect its fragile environment.

Public Law 643, 81st Congress, approved August 3, 1950, establishing the Baltimore-Washington Parkway, authorized the Department of the Interior to accept from any Federal Agency or Department, without reimbursement, the transfer of lands adjacent to the Parkway, for park and recreational purposes.

On October 2, 1950, Assistant Secretary of the Interior Dale E. Doty, wrote a letter to Mr. John T. Eagan, Commissioner, Public Housing Administration, requesting that land adjacent to the B/W Parkway that was surplus to his needs for the development of the Greenbelt City Public Housing Project, should be transferred to the National Park Service.

On November 30, 1950, Commissioner Egan transferred 1,147 acres of land to the Department of the Interior with the understanding that such land would be used for park and recreational purposes.

II. SIGNIFICANCE OF PARK RESOURCES

Greenbelt Park is an 1,147 acre woodland of low, rolling hills, located on both sides of the B/W Parkway and adjacent to I-495 in Prince Georges County, Md., approximately 10 miles from downtown Washington, D.C. It is a mature forest, primarily pines and oaks, containing many trees 50 or more years old.

As a recreational resource this woodland is beautifully adapted to the recreation needs of residents of nearby suburban Maryland communities and the District of Columbia. Facilities have been developed within this setting for outdoor activities such as picnicking, camping, hiking, biking, horseback riding and outdoor sports.

III. LAND CLASSIFICATION

All of Greenbelt Park's 1,147 acres fall within the natural environment sub-zone of the natural zone classification. Included in this classification are all roads and trails, maintenance area, park headquarters, three picnic areas, park campground, and Conestoga group campground. There are no other developed areas within the park.

IV. INFLUENCES ON MANAGEMENT

A. Legislative and Administrative Constraints - Public Law 643 requires that Greenbelt Park be used for park and recreation purposes, therefore the park has been designated as a "Recreation Area" and is managed in accordance with Service policies for such areas.

In November 1953, the U.S. Park Police assumed jurisdiction and patrol of B/W Parkway and Greenbelt Park.

In 1965, Greenbelt Park and the B/W Parkway were placed under the management of Catoctin Mountain Park.

B. Regional Influences - Greenbelt Park is located 10 miles north of Washington on the B/W Parkway. The park is easily accessible from the Capital Beltway, I-495, and North-South Route I-95. 1974 population figures for the Standard Metropolitan Statistical Areas of Washington and Baltimore reveal that within 20 miles of the park, there are over 5 million people. Visitation counts for the park show a continuing yearly increase. Under existing conditions the park could accommodate a maximum of 1,500,000 visitors and 100,000 campers per year with proper maintenance standards and a continuing program of resource management.

An important influence is the heavy local use by visitors from the immediate vicinity - notably the surrounding Maryland suburban communities of Greenbelt City, College Park, Riverdale, Bladensburg and Hyattsville.

Public Law 91-605, approved December 31, 1970 authorized the appropriation of $65,000,000 out of Highway Trust Funds for the reconstruction to 6 lanes, the section of the B/W Parkway in the State of Maryland under the jurisdiction of the Department of the Interior. When reconstruction is complete (1982) administration, maintenance and jurisdiction of the 20-mile section now administered by the National Park Service will pass to the State of

Maryland. This reconstruction will convert the Parkway to an acceptable alternate to the present I-95 and provide to the traveling public a shorter, more direct route to Washington and points south. Present signing on the Parkway directs travelers to camping facilities at Greenbelt Park. With expected additional vehicle traffic, use of camping facilities at the park could substantially increase.

Greenbelt Park is surrounded by numerous small subdivisions and communities. Interested citizenry in these communities present to management a vested interest which can effect proposed development and changes in park policies.

The Maryland National Capital Park and Planning Commission is a very powerful, recreation-oriented organization, with headquarters located a short distance from the park. Liaison is maintained with this organization in future recreational planning for the park and surrounding communities.

The acquisition of additional land bordering the park is not essential since there are numerous regional and local recreational areas and playgrounds situated in the surrounding communities.

C. In-Park Influences - The park is bordered on three sides by individual family dwellings and high-rise apartments. This presents problems of litter, encroachment and easy access for unauthorized use of park lands.

Emergency assistance such as fire and ambulance service is available within five minutes from nearby communities. Prince Georges Hospital is within a three minute drive from the park. Park employees receive first aid training on a regular basis.

Feral dogs and cats, a result of private land-owners near the park, present a minor problem. Control methods are initiated by the park staff and the Prince George's County Animal Shelter.

During periods of good weather, especially on weekends and holidays, the park fills to capacity with picnickers, bicyclists, hikers and general sightseers. The capacity of the park is limited to the availability of parking spaces, including the maintenance area, which is used for overflow parking. When those areas are at capacity the park is closed to further use. This practice has proven beneficial in providing a quality experience to visitors and preventing overuse and deterioration of park facilities and it fragile environment.

The responsibility for the operation and maintenance of Greenbelt Park is divided among different National Capital Parks organizational units. For example: The Brentwood Auto Shop provides supervision and direction to the auto mechanic assigned to the park. The directional and regulatory signs in Greenbelt Park and on the Baltimore-Washington Parkway are administered by the Office of Chief of Maintenance, National Capital Parks. The administrative and supervisory responsibilities for the park and parkway are conducted by Catoctin Mountain Park, a distance of 65 miles from Greenbelt Park.

V. MANAGEMENT OBJECTIVES

1. Manage Greenbelt Park as an outdoor recreational area encouraging visitor activities compatible with the limited space and natural qualities of the park.

2. Provide interpretive programs directed to the needs of both local and national visitors and which relate to the park environment and its setting in a large urban community.

3. Develop a complimentary system of bike and hiking trails in the park that would link with regional trails being planned by Maryland National Capital Park and Planning Commission (MNCP&PC) and other local government agencies.

4. Maintain the Baltimore-Washington Parkway as a scenic National Park Service Parkway until it is reconstructed and transferred to the State of Maryland.

5. Maintain the natural character of the park as a resource of special value for green space usable for limited outdoor recreational programs.

6. Participate in the overall planning of recreational developments with county and local citizen groups to prevent duplication and coordinate cooperative activities with county and local citizen groups.

7. Get involved with the school systems of neighboring communities in a program of awareness of the environment ethic through environmental education activities.

APPENDIX C:

ARCHEOLOGICAL REPORT AND MAPS

GREENBELT PARK

ARCHAEOLOGICAL

BACKGROUND RESEARCH AND

EVALUATION OF EXISTING DATA

by
Robin D. Ziek

DENVER SERVICE CENTER
BRANCH OF HISTORIC PRESERVATION
NATIONAL CAPITAL TEAM
NATIONAL PARK SERVICE
UNITED STATES DEPARTMENT OF INTERIOR
DENVER, COLORADO

February 1979

Introduction

A preliminary review of the archaeology, past and future, in and around Greenbelt Park was necessitated by the detailing of a Development Concept Plan for the park by the National Capital Team, Denver Service Center. This review recommends an archaeological program which will proceed according to the guidelines required by sections 2(a), 2(b) and, where applicable, 1(3) of Executive Order 11593; section 106 of the National Historic Preservation Act of 1966; and presented in 36CFR, Part 66.4, Appendix B. These sections call for an archaeological inventory of the cultural resources in the national parks which may be effected in phases. Such an archaeological program for Greenbelt will provide this inventory which may be used in future planning for the park.

A copy of a map of Greenbelt Park is attached.

Background

Greenbelt Park is a woodland in Prince George's County, Maryland which provides a green area for the people in and around the nation's capital. The 1,100 acres are divided into two sections by the Baltimore-Washington Parkway. Approximately two-thirds of the park, which lies west of the Parkway, have been developed by the National Park Service with camping facilities and hiking trails, while the area to the east (the "300 Acres") remains undeveloped. A branch of the Paint Branch Creek (which is a tributary of the Anacostia River) forms part of the western boundary of Greenbelt Park, and also bisects the park east-to-west. Several smaller streams drain into that branch, including four stream beds in the "300 Acres", two of which are intermittent.

There are no verified sites in the park. Nothing has been registered with the Maryland Geological Survey, and nothing has been nominated to the National Register. There has been, however, no attempt at a systematic survey for either prehistoric or historic sites.

There have been no historical studies of Greenbelt Park published.* General histories of Prince George's County and Maryland will help provide a general historical sketch of Greenbelt, but the specific history of those acres included in Greenbelt has yet to be researched. Such a study would involve a search through county courthouse property records and documents in the collections of the Maryland and local historical societies.

The earliest map which includes this area is that of Captain John Smith, published in 1612. Hundreds of Indian villages are located on this map along major rivers and streams, and further identified by the Indian name. Greenbelt, being inland, was not investigated by Smith. Historic maps (Martenet: 1861 and Hopkins: 1878) identify house sites with the occupant's name, although neither building clusters nor land tracts are delineated.

* Ed Smith, historian, National Capital Team, Denver Service Center. (Personal Communication - August 22, 1979).

According to the 1861 map, there were several houses in the area west of the Parkway and only one house site in the "300 Acres" - that of William Harvey. By 1878, several sites changed hands (as indicated by name changes) and the William Harvey place is not shown at all.

Wayne Clark, the archaeologist for the Maryland Historic Trust, made a brief survey along North Branch-Still Creek in the western portion of the park, and found one lithic flake and several historic ceramic sherds (Clark: 1979a) which may indicate both prehistoric and historic use of the park area.

Present Conditions

On January 22, 1979, I went out to Greenbelt Park to talk with Ranger Ann Henninger and to look briefly at the park. The opportunity presented itself for an aerial reconnaissance by helicopter of the undeveloped "300 Acres" and surrounding area of Greenbelt Park. Conditions were favorable and visibility was good, but there were no cultural resources apparent.

Archaeological sites may be obscured and difficult to locate due to the reforestation of the park. The historic maps may help offset this difficulty in planning a survey of historic sites. While Smith's 1612 map is not specifically helpful because of the park's inland position which made this area relatively inaccessible for Smith, the map does indicate a sizeable Indian population in this area which increases the likelihood of there being prehistoric sites in the park. Judging from recent archaeological work in this area* (Clark: 1979b), it is likely that some prehistoric sites will be found adjacent to the streams that run through Greenbelt.

A recently acquired piece of land, the so-called Jaeger Tract, was accepted by the park in a badly eroded state and, further, it had been used as a dump for years. The park has been removing trash from this area and eroded gullies have been reclaimed as park land by using clean soil as landfill. While covering this tract with soil and planting grass will have the effect of burying any archaoelogical sites which may be present, it will also protect these sites (if there are any) from further deterioration.

* Wayne Clark reported that he found six sites (5 prehistoric, 1 historic) in a survey of a tributary of the Paint Branch Creek just north of College Park, Maryland. Sites were found along the stream at an elevation of 100 to 140 feet above sea level.

Recommendations

An archaeological survey of the entire park should progress in stages. County records and historical society records should be searched for deeds and property descriptions, as well as any other relevant primary- and secondary-source material. Since there are no such historical studies of Greenbelt, sufficient time and funds must be allocated for this historical research.

This historical data should then be correlated with other source material such as that provided by aerial photographs. Preliminary study will involve the evaluation of aerial photographs (black and white, and infrared) which were taken in the spring of 1978 for any anomalies. A topographic map will also be used to identify likely site locations. Likely places for prehistoric sites include areas along the streams and relatively flat areas which are within easy reach of a water source.

Ground-truthing methods for anomalies that appear in aerial photographs will include field examination and possibly test pitting. A survey along the streams and in the flat areas may be carried out at the same time and will also be used to determine site locations.

Phase three of the archaeological inventory of Greenbelt Park's cultural resources would consist of a more intensive examination of any sites which had been identified in the preliminary survey. Examination at this point would be used to determine any site's qualifications for nomination to the National Register.

In determining priorities for an archaeological investigation of Greenbelt, the prime concern will be public accessibility to a site. Any anomalies which appear in aerial photographs in the western portion of the park should be examined first as sites here would be more susceptible to destruction

because of present public use in this area. The Jaeger Tract has a history of disturbance and, therefore, a survey in this area would have a low priority.

If no endangered sites are found in the western acres, archaeological efforts may be directed to the undeveloped "300 Acres". A detailed survey of the "300 Acres" at this time would certainly be of use in the future management of cultural resources and planning for development of these timbered acres.

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1979a Private Communication, February 14, 1979
1979b Private Communication, February 27, 1979

Curry, Dennis Archeological Reconnaissance of the Baltimore-Washington Parkway from the Washington, D.C. line to the Baltimore city line, 1978

Van Horn, R. Lee Out of the Past, 1976 reprint

MAPS

1612 John Smith, Captain John Smith's Map of Virginia; facsimile / in Maryland Room, University of Maryland /from an engraving in the Library of Congress.

1673 Augustin Herrman, Virginia & Maryland as it is planted & Inhabited This Present Year 1670. Published by His Majesty's Royal License, 1673. Facsimile / in Maryland Room, University of Maryland / from original map in John Carter Brown Library, Providence, Rhode Island, 1948.

1861 Simon J. Martenet's Map of Prince George's County, Maryland; reprinted by Prince George's County Historical Society, 1976.

1878 G.M. Hopkins, Atlas of 15 Miles around Washington

1971 USGS Map, Washington East, Maryland - D.C.

1976 Greenbelt Park, NPS leaflet

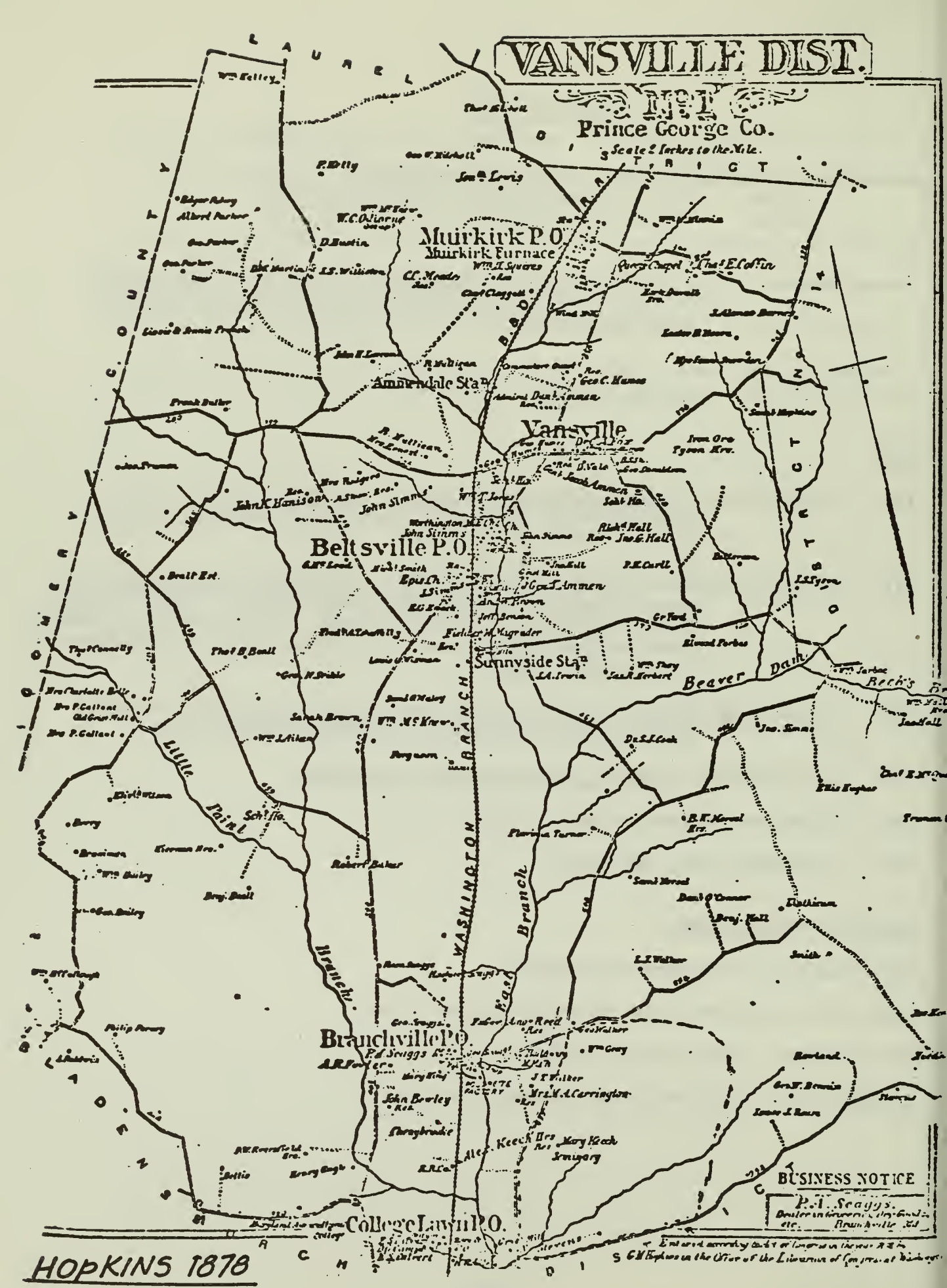
PERSONAL COMMUNICATIONS

Tyler Bastian, Archaeologist, Maryland

Wayne Clark, Archaeologist, Maryland Historic Trust

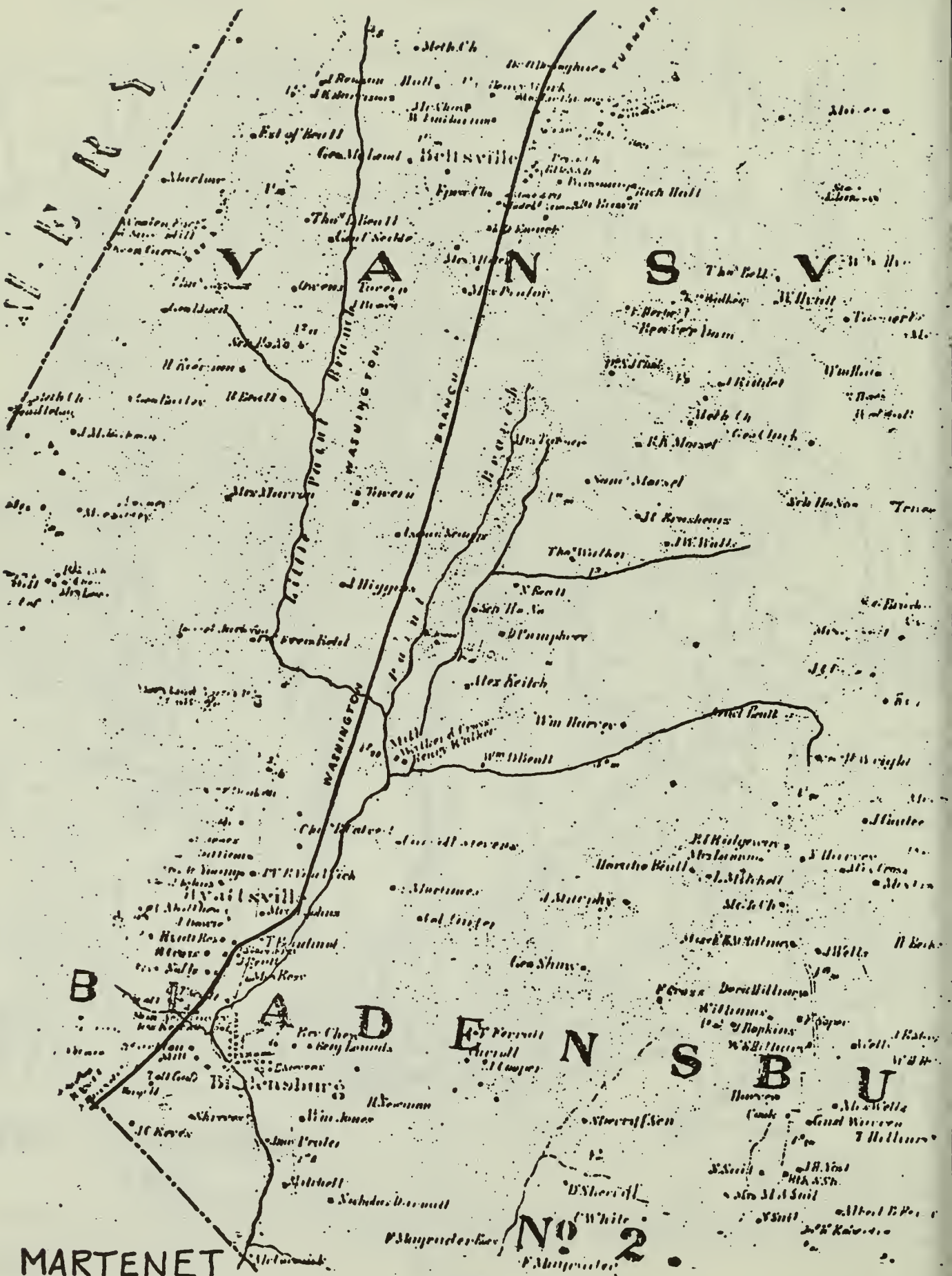
Ann Henninger, Ranger, Greenbelt Park

Greenbelt Park Public Workshop, February 22, 1979



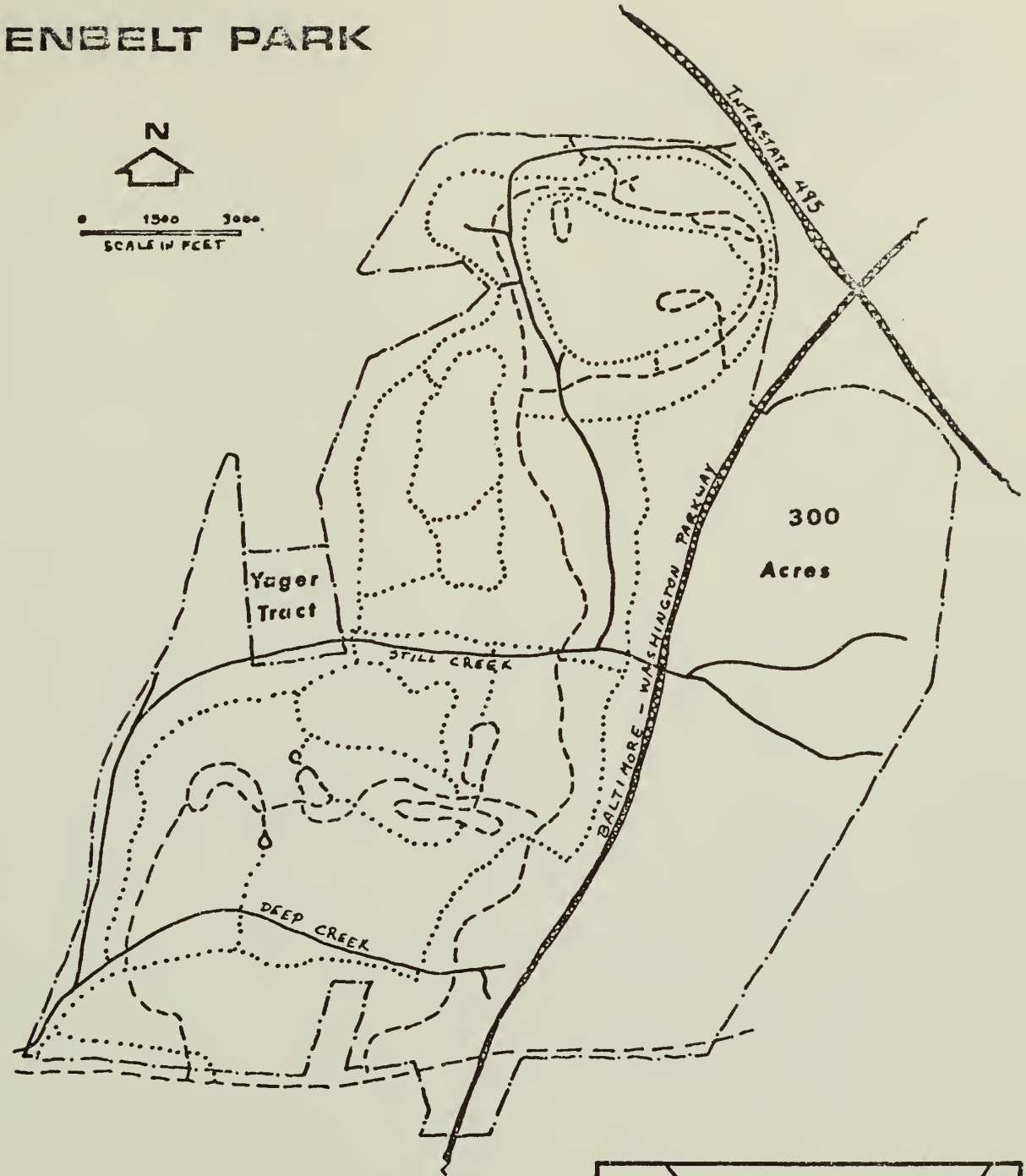
HOPKINS 1878

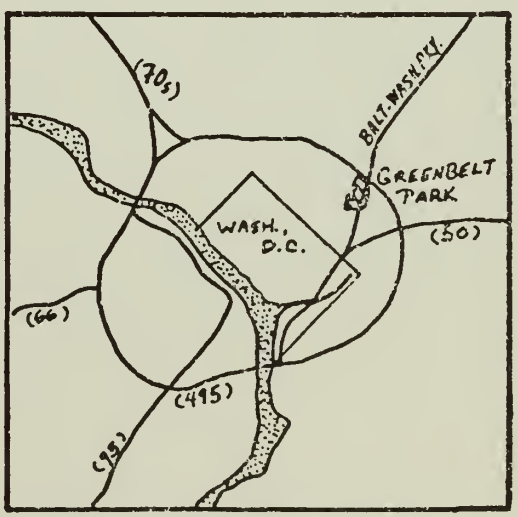
MARTENET MAP
1861



MARTENET
MAP ~ 1861

GREENBELT PARK





VICINITY MAP

R.D. ZIEK
9-17-79

APPENDIX D:

PARK AND RECREATION FACILITIES

PARK AND RECREATION FACILITIES

Key

BaB	= baseball	PD	= partially developed
BB	= basketball	PS	= picnic shelter
CS	= comfort station	RB	= enclosed recreation building
D	= developed	SB	= softball
FB	= football	SC	= soccer
G	= golf	SHRR	= shelter with restrooms
HS	= horseshoes	TC	= tennis courts
PA	= picnic area	UD	= undeveloped
PE	= playground equipment		

Park	Acreage	Status	Activities
Acredale Recreation Center	40.0	D	SHRR,PA,RE,B,SB,FB,HS
Adlephi Manor Recreation Center	25.0	D	SHRR,PA,PE,BaB,SB,FB,[illegible]
Adelphi Mill Recreation Center	30.0	D	RB,PA,PE,HS
Adelphi Park/School	8.6	D	RB,SB,2TC,BB
Avondale Recreation Center	11.3	D	BaB,FB,2TC,BB,HB,VB
Bellemeade Park/School	0.4	UD	-
Berwyn Playground	2.1	D	PA,PE,SB
Berwyn Heights Playground	3.0	D	PA,PE,BaB,SB,FB,BB
Berwyn Heights Elementary School	Gym	D	Gym
Bladensburg Park/School	5.2	UD	-
Brentwood-Allison Playground	0.7	UD	-
Brentwood-Volta Playground	1.5	UD	-
Browning's Grove Recreation Center	9.0	D	PA,PE,SB,2TC,BB,PA
Calvert Park Recreation Center	10.3	D	SHRR,PA,PE,SB,BB
Calvert Road Recreation Center	30.0	PD	PA,PE,2TC,HS,PS
Cherry Hill Playground	8.0	D	PA,PE,SB
Cheverly East Playground	6.3	UD	-
Cheverly Recreation Center	13.8	D	PE,SB,FB,2TC,BB
Chillum Hills Playground	4.15	UD	-
Chillum Road Recreation Center	7.4	UD	-
Chillum Recreation Center	40.0	D	PA,PE,SB,FB,Bab,2TC,[illegible]
College Park Airport	56.0	D	Historic Site
Crittenden Street Playground	3.0	UD	-
Decatur Heights Playground	4.1	UD	-
Dueling Branch Park	2.9	UD	-
Edmonston Playground	0.5	UD	-
Fletchers Field Recreation Center	40.0	D	SHRR,PA,PE,BaB,SB,FB,[illegible]
Glenridge Playground	2.4	UD	- BB
Glenridge Recreation Center	11.9	D	PE,BaB,FB,TC,BB
Good Luck Estates Recreation Center	5.3	D	CS,PE,2TC,BB
Green Meadows Recreation Center	40.0	D	CS,PE,BaB,FB,SB,2TC,[illegible]
Hamilton Playground	12.0	D	PA,PE,SB,BB
Heurich Recreation Center	30.0	D	CS,PA,PE,BaB,SB,FB
Hillwood Manor Playground	3.0	D	PA,PE,BB

Park	Acreage	Status	Activities
Hollywood Park/School	23.7	D	CS,PA,PE,SB,BaB,FB,2TC,B
Hyattsville-Dietz Park	1.5	PD	- HS,H
Kerilworth Roadside Park	1.0	D	PA,PE,HS
Kirkwood Recreation Center	15.0	D	PA,PE,SB,BB,HS
Lake Artimosia	9.5	D	?
Landover Recreation Center	15.7	D	?
Lane Manor Recreation Center	40.0	D	RB,PA,PE,BaB,SB,RB,2TC,B
Lewisdale Elementary School		PD	- H
Lewisdale Recreation Center	10.0	D	PA,PE,SB,BB
Long Branch Recreation Center	7.1	D	PA,PE,BB
Melrose Playground	3.0	D	PE,SB,BB
Mt. Rainier North Playground	1.7	D	PE
Mt. Rainier South Playground	0.8	D	PE,BB
Mt. Rainier 30th Street Playground	0.53	D	PE,BB
Mt. Rainier Upshur Street Playground	0.19	D	PE
New Carrollton Recreation Center	6.11	D	SHRR,PA,PE, 6TC,BB,HS
North Brentwood Community Center	2.0	D	?
North Brentwood Playground	4.0	D	PA,PE,BB Snack B
Paint Branch Golf Course	40.0	D	9G,Pro Shop, Putting Gre
Parklawn Recreation Center	20.0	D	RB,PA,PE,SB,BB,HS
Parklawn Park/School	5.8	D	-
Peace Cross	0.3	D	Historic Site
Prince George's Plaza Community Center	1.0	D	-
Prince George's Publick Playhouse	Theatre	D	Cultural Site
Queenstown Playground	3.0	D	PE
Riggs Manor Playground	2.0	D	PA,PE,BB
Riverdale Playground	1.41	D	PA,PE,SB,BB
Riverdale Hills Park/School	4.2	UD	-
Riverdale Recreation Center	50.0	D	RB,PA,PE, BaB
Riverside Drive Playground	10.0	D	CS,PA,PE,SB,SC,BB
Robert Frost Park/School	1.2	UD	-
Robert Yost Playground	2.0	D	PE
Rogers Heights Elementary School	.5	D	2TC
Schrom Hills Recreation Center	36.9	UD	-
Sligo Creek North Playground	3.0	D	PA,PE,BB,HP
Takoma-Langley Community Center	2.0	D	-
Takoma Park South Playground	1.6	UD	-
Takoma Park Community Center	6.4	UD	-
Templeton Knolls Park/School	5.1	D	PA,PE,HS,PS
38th Avenue Recreation Center	10.0	PD	2TC,BB
University Hills Recreation Center	6.7	D	PA,PE,Duck pond
West Lanham Hills Park/School	6.5	D	PA,PE,TC
West Lanham Hills Recreation Center	7.4	UD	-
Woodlawn Recreation Center	4.6	D	RB,PA,PE,SB,BB,HS
	TOTAL -- 840.79		

Source: Background Information for the Proposed Amendment to the General Plan for the Maryland-Washington Regional District Within Prince Georges County by the Maryland-National Capital Park and Planning Commission, November, 1977.

APPENDIX E:

GEOLOGY REPORT

Geology of Greenbelt Park
Prince Georges County, Maryland

by

John T. Hack

U.S. Geological Survey

Introduction

Greenbelt Park is mostly wooded and hilly having a total relief of 150 feet. The Park occupies an area of about 2 square miles. It is bounded on the north by Greenbelt Road, on the south by Good Luck Road, on the west by Kenilworth Avenue and on the east by the Village of New Carrollton. The Baltimore-Washington Parkway occupies a narrow strip near the eastern side of the Park. The Park lies in the inner Coastal Plain on ancient fluvial sediments of the Potomac Group of Lower Cretaceous age (120 to 100 million years). The sediments consist of clay silt sand and gravel, with clay and silty clay making up by far the largest part. Tertiary or Quaternary gravel (probably 1 to 5 million years old) overlies the Cretaceous sediments in the northwest corner of the Park. The stream valleys generally have broad alluvial floors. Large gullies on some hillslopes were probably cut after deforestation in the 18th and 19th centuries. The eroded material was deposited as alluvium in the larger valleys.

Method and Reliability of Survey

Because the Park is heavily wooded except for open areas in which grass is maintained, the sedimentary materials in the ground are mostly concealed. The area was mapped by observing scattered outcrops in ditches along roads, in deep gullies that occur along Deep Creek and in the headwaters of Still Creek and other drainages. These observations were supplemented by probing with a three foot long soil auger. Because the topography is hilly and the sediments are arranged in layers that have some lateral continuity, it is possible to infer the nature of the column of sediments beneath the Park (Fig. 2). The pattern of the geology that emerged during the mapping is consistent with the geology of the surrounding area as known from the work of others. The general pattern shown in the present map (Fig. 1) is reliable, but details may be in error in some places by as much as tens of feet. It is recommended that before any large construction is undertaken in the Park, the local distribution of sand, gravel, and clay should be tested by drilling.

Although the major part of the Cretaceous sediments is clay, a layer of gravel can be traced through the Park west of the Baltimore-Washington Parkway. This gravel layer serves as a horizon marker that shows how steeply the Cretaceous deposits are tilted toward the southeast. This layer or horizon marker separates two units, slightly different in character as described below.

Geologic Setting

Greenbelt Park is shown at a small scale on several existing geologic maps (Miller, Bibbins and Keith, 1911; N.H. Darton, 1947; C.W. Cooke, 1951; and J.T. Hack, 1975). As shown on these maps, the Park lies within a nine mile wide of sediments about 700 feet in thickness collectively referred to as the Potomac Group. It occupies the area between the Montgomery County line and a line extending northeast from Seat Pleasant to Bowie and consists of three formations; all are of Lower Cretaceous age. The lowest and oldest is called the Patuxent Formation and is largely sand and gravel with lenses of white or gray clay. The Patuxent Formation does not crop out in the Park but is exposed to the west. Above the Patuxent Formation is the Arundel Formation which consists mostly of drab gray clay. The clay includes concretions and layers of iron carbonate (siderite) and iron hydroxide (limonite). The iron minerals were extensively mined in the 19th century (Singewald, J.T., 1911). Logs and fragments of lignite and carbonized wood are common. Sand and gravel layers also occur at some localities. Both plant fossils and dinosaur remains have been found in this formation. The upper part of the Potomac group is known as the Patapsco Formation and consists of a complex sequence of sands, clays (generally red or variegated in color) and gravel. The individual layers of the sequence are irregular and so complex they are difficult or virtually impossible to map at any scale.

The Potomac Group is now thought to be a sequence of deltaic deposits formed by a large river system along an ancient continental border. This interpretation explains the complexity of the sediments and their distribution. Clays and lignite formed in backswamps of abandoned channels. Sands were laid down along levees or as point bars on the inside of river bends and gravel accumulated in bars and channels. As sediment accumulated in thickness and the channels shifted, the sands, clays, and gravel became superimposed in a complex pattern. The nature and origin of the sediments have been studied by Glaser (1969).

Miller, Bibbins and Keith (1911) show the three formations of the Potomac group on their geologic map. As shown on their map, the Arundel Formation in Greenbelt Park crops out in the valleys of Deep and Still Creeks below altitudes of 70 to 80 feet. The remainder of the deposits of Cretaceous age within the Park area were assigned to the Patapsco Formation. Later workers believed that except locally it was not possible to separate the three formations in the Potomac Group precisely, and they have included the Arundel Formation as part of the Patapsco Formation, or they have grouped all three formations into one unit, the Potomac Group. Nevertheless, in Prince George's and Arundel Counties the three units are distinct and locally they can be clearly separated.

In addition to the Potomac Group, the maps of Miller and Bibbins (1911) and Darton (1947) show a sand and gravel terrace unit within Greenbelt Park. This unit, according to their interpretation, is much younger than Cretaceous and probably Quaternary in age (2 million years or less) though a Pliocene age (2-5 million years) is possible. This unit now occupies areas over 200 to 220 feet in altitude in the vicinity of the apartment complex on Kenilworth Avenue. Some of the gravel has been quarried and removed. As mapped by Darton (1947), the original gravel deposit extended westward into Berwyn Heights and is essentially horizontal. As a result of the present detailed survey, the writer agrees that these gravel deposits are an ancient river terrace deposit.

The geologic map of Greenbelt Park (Fig. 1) shows 5 geologic units. The Quaternary alluvium and low terrace deposits are essentially the same as the Recent Alluvium of Darton (1947). The high terrace deposits are the same as the river terrace deposits of Darton (1947). The Potomac Group, however, could not be subdivided into the formal geologic formations recognized by others because of the poor exposures. Instead two informal units were mapped. They are defined by their relation to a thin gravel layer that extends from northeast to southwest through the park.

Potomac Group

Lower clay unit: As shown on the map, the lower clay unit is found only in the western part of the Park. It is poorly exposed because the slopes are steep and commonly covered with gravel and sand that has slumped over them. Exposures do occur in some hillside gullies and in Deep Creek, which is incised as much as 10 feet below the alluvial valley floor.

The maximum thickness exposed in the Park is about 60 feet. Judging by the good exposures in Deep Creek, the unit is mostly white, gray, variegated red and gray clay, and silty and sandy clay. No gravel layers were observed.

Upper sand and clay unit: The lower clay unit is overlain by a bed of gravel that underlies the service area near the Park Headquarters. It is referred to here as the "Headquarters gravel," and defines the base of the upper sand and clay unit. The gravel ranges in thickness from zero to several tens of feet being thickest in the western part of the Park. It crops out in Deep Creek a short distance west of the Park Road where it is 1 to 3 feet thick and is firmly cemented by limonite (iron hydroxide). Only about 20 outcrops of the Headquarters gravel were found in the Park. The elevations of the Headquarters gravel outcrops can be fitted into a geometric plane that slopes southeastward at .75 degrees (70 feet per mile), an angle corresponding to the regional slope of the Cretaceous sediments. Thus it can be inferred that these gravel outcrops mark the trace of a single layer or zone. The regional slope is known

from work done by Withington and Froelich (1974) in the Beltsville quadrangle less than one-half mile north of the Park. Other gravel outcrops were found that could not be fitted into a continuous sloping horizon. They are interpreted to be small channel fillings within the map unit. The local channel gravels are not shown on the geologic map. At some places along the contact inferred from the trace of the Headquarters gravel, no gravel was found and at those places it must be missing or is very thin. No gravel that could be part of the Headquarters layer was found in an area south of the apartment towers and none was found on the south side of Deep Creek. However, many boulders of a cemented gravel layer were found just north of Camp Conestoga, at an altitude of 90 to 100 feet and are probably on the trace of the headquarters gravel.

The remainder of the upper sand and clay unit, while mostly clay, contains lenses of sand with occasional pockets or thin levels of gravel or gravelly clay. Extensive sandy and sandy clay areas are underlain by ironstone, as shown by many fragments of ironstone on the surface or in the soil. Ironstone is a common term for gravel, sand, or silt that is cemented to rock-like hardness by iron oxide that fills the interstices between the grains. It is brown in color and generally quite tough. The ironstone layers range from 1-1/2 feet in thickness to less than 1/4 inches. Areas that

have large quantities of ironstone immediately beneath the surface are shown by a check pattern on the geologic map. Such areas are more sandy than others. The area inside the Dogwood Trail Circuit is perhaps the most noteworthy.

The deposits in the 300 acres east of the Baltimore-Washington Parkway are higher in the geologic section than those to the west. They contain less ironstone, and are predominantly clay, but in some places sand layers over 10 feet thick were found. Because of poor exposure, the sand layers could not be mapped in the time available.

High Terrace Gravels

The high terrace gravel deposits consist of sand and gravel, and occur near the apartment complex in the northwest part of the Park. They cannot be part of the units of Cretaceous age as they overlap them on a more or less horizontal plane, as clearly shown on the map of Darton (1947). A large part of this unit has been removed to use in construction. Similar areas of high terrace gravels are scattered through the coastal plain part of the Washington area. They are remnants of once more extensive channel deposits of streams that flowed from the Piedmont across the coastal plain toward the sea.

Low Terrace Deposits

Distinct, nearly level terraces occur in a few places that rise 10 to 15 feet above the alluvial stream deposits in the Park. Much of the material in these deposits is sandy, but clay is abundant. Terraces are generally well drained. Other terrace deposits that are too small or too narrow to form distinct topographic surfaces may occur on the sloping sides of some valleys. The boundaries of the low terraces were mapped by reference to the soil map of Prince George's County (Kirby et al., 1967).

Alluvium

Broad areas of alluvium occur in the Park. The alluvium is commonly as much as 8 feet thick along the larger streams. Many streams have eroded deep channels in the alluvium with vertical walls that resemble the arroyos of the west. In many of these channels the stream has cut down far enough to expose the underlying fresh Cretaceous clays. The alluvium is composed mostly of clay but sand and gravel are common. The distribution of alluvium was mapped by reference to the soil maps of Prince George's County (Kirby et al., 1967).

Structure

The Potomac Group deposits of Cretaceous age are part of a wedge of sediments that slope and thicken to the southeast. They rest on hard crystalline rocks similar to those in the Piedmont region which are exposed about 4 miles to the west.

The surface of these crystalline or so-called basement rocks slopes southeasterly beneath the Coastal Plain at about 1.1 degrees (100 feet to the mile) as shown by Darton (1947). At Greenbelt Park, the crystalline basement is at an altitude of about 200 feet below sea level. The deposits of Cretaceous age in the Park have a gentler slope of .75 degrees (70 feet to the mile) to the southeast.

Construction Conditions

The geologic map provides a crude means of determining conditions that may be encountered during large-scale grading or construction operations. The clay deposits in this area do not have swelling properties and therefore are suitable for structures in flat areas. However, the clays are commonly silty and sliding is likely to occur on slopes, especially if wet.

Sandy and gravelly areas, if thick enough, can be expected to be quite stable. Areas of abundant ironstone may cause problems in grading.

Because of the complexity of the stratigraphic relations in the Park, especially in the upper sand and clay unit, heavy construction should not be undertaken without test drilling.

Gullies

Many of the slopes in the Park show evidence of gullying at some time in the past. Some narrow ravines on steep slopes are 10 to 20 feet deep and appear to be incised in valleys

that were originally more shallow. Most of the gullies on sloping land are now inactive and overgrown by large trees. Many alluvial areas with low slopes, on the other hand, are cut by deep gullies with vertical to near vertical sides that expose the alluvial deposits and in places cut the bedrock. These gullies are clearly active at the present time. They are especially impressive along Deep Creek but they also occur on Still Creek and some of its tributaries. The gullies probably are the result of changes in land use that had different effects on drainage areas of different sizes and slopes.

It was shown by J.E. Costa (1975) in a study of the nearby Piedmont that changes in land use during the last 300 to 400 years had a significant effect on sedimentation and erosion. When the land was extensively cultivated in the 17th and 18th centruies, soil and other sediment were removed from the uplands by soil creep, sheetwash, and gullying. Some of this material was carried away but much was redeposited on floodplains in small watersheds less than 10 square miles in area. On the average, about 3 to 4 feet of alluvial material was added to the flood plains. When agricultural land use declined after 1900, the rate of erosion of the sloping land slowed and the load of sediment supplied to the streams declined. The streams responded to the change in sediment load by entrenching their flood plains.

The same sequence of events probably occurred in Greenbelt Park. Colluvial material and fan-shaped areas of slope wash deposits that contain a mixture of coarse and fine materials are found on many of the lower hill slopes. These features as well as the gullies are now mostly overgrown by forest containing large trees. The deep arroyo-like features that cut the flood plains of Deep and Still Creeks and some of their short tributaries result from the decline of in the sediment supply from the upland areas.

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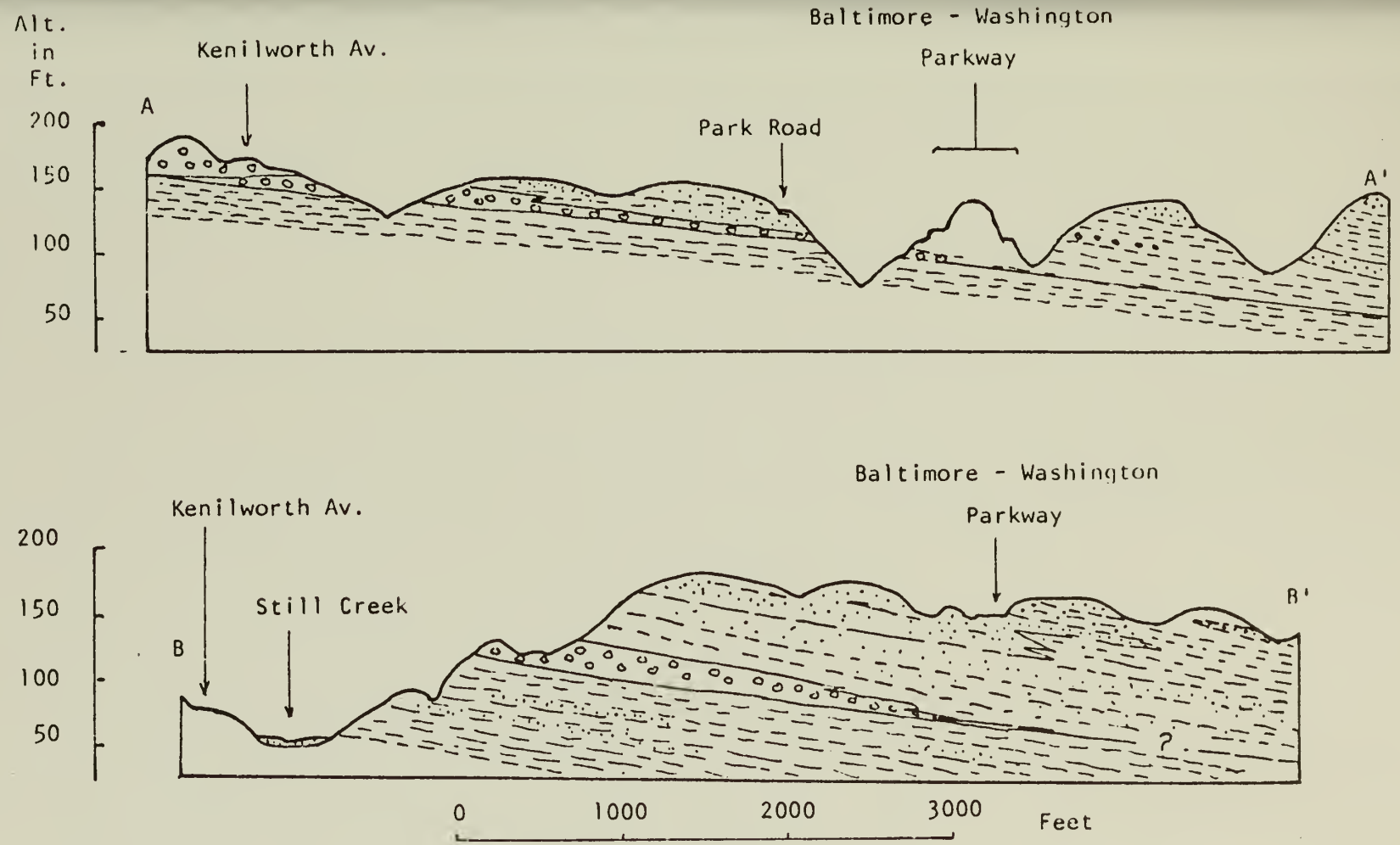


Vertical exaggeration approximately 8 times

Diagrammatic cross sections of deposits in Greenbelt Park

APPENDIX F:

HYDROLOGY REPORT

HYDROLOGIC STUDY

GREENBELT PARK, PRINCE GEORGE'S COUNTY

MARYLAND

REQUEST AND AUTHORIZATION

This report has been prepared in response to a request (D18-DSC-TNC) from the Denver Service Center - National Capital Team (National Park Service) U.S. Department of the Interior, to the Prince George's County Planning Director in a letter dated September 21, 1979.

Scope of Study

This report describes a study of the hydrological characteristics in the region of Greenbelt Park.
Flood flows on Still and Deep Creeks and their tributaries were studied.

Data Base Generation

Available topographic, hydrologic and soil data from published and unpublished sources were collected. The data acquisition was structured to define the hydrologic and hydraulic characteristics of both the park and the creeks that traverse the area.

Community Description

Greenbelt Park, an extensive open space resource in Federal ownership is located in the northwest portion of Prince George's County in Maryland. It is bounded on the north by Greenbelt Road (MD. Route 193), on the south by Good Luck Road, on the west by Kenilworth Avenue (MD. Route 201) and on the east by Interstate 495, Kepner Court, Nashville Road and Texler Road. Baltimore Washington Parkway runs through the park in a north - south direction, dividing it into two unequal parts. The park occupies an area approximately 1000 acres in size.

Deep Creek rises west of the intersection of Good Luck Road and Trexler Road. It flows in a westerly direction draining approximately 284 acres, in the lower portion of the park. Elevations in its watershed range from 150 feet mean sea level (M.S.L.) to 40 M.S.L. Soils in this watershed consist mainly of the Bibb Silt Loam along the creek, the Christiana and the Chillum Silt Loams on the northern portion of the watershed, the Christiana and the Sunnyside fine sandy loam on the southern portion. According to the Soil Conservation Service Soil Group Classification, the soils in the northern portion fall into Soil Group C and the Sunnyside fine sandy loam fall into Group B. Soil Groups A, B, C, and D describe the relative infiltration or runoff potential of a soil type. A denotes a soil group with high infiltration potential even after being thoroughly wetted and D denotes a group with high runoff potential.

Still Creek rises outside the park, north of the intersection of Interstate 495 and Good Luck Road. The main stem flows in a westerly direction as it divides the park into 2 approximately equal parts. Three tributaries join the main stem in the vicinity of the Baltimore - Washington Parkway as it drains approximately 2116 acres. Elevations in the watershed range from 200 feet M.S.L. to 40 feet M.S.L. A vast array of soil types exist within the Deep Creek watershed. These include the Bibb Silt Loam, along the Creek's main stem and tributaries, the Christiana, the Sassafras, the Sunnyside, the Muirkirk and the Galestown. The Galestown soil type fall into Soil Group A. The Bibb and the Christiana Series fall into Group C and the rest fall into Soil Group B. The two creeks converge at the southwest end of the park approximately 1500 feet north of the intersection of Kenilworth Avenue and Good Luck Road.

Engineering Methods

Standard hydrologic and hydraulic study methods were used to determine the data in this report. Floods having a recurrence interval of 10 and 100 years have been selected as having special significance to flood plain management. The analysis reported here reflect both present and proposed development conditions.

Hydrology

The peak discharge values for the Creeks at the selected cross sections were determined using the Soil Conservation Service procedure for peak flow computation as outlined in Technical Notes - Engineering 20 (RN.2), (Reference 1). Still Creek was divided into 7 sub-areas labelled A, B, C, D, E, F and G. Deep Creek was treated as a unit. For each sub-area, the soil group and land use cover-complex for present and proposed development were used to develop a runoff curve number (RCN). The Drainage area (D.A), the time of concentration (T_c), time of travel (T_t), for each routing reach and the 24-hour precipitation in inches for the 10 and 100 year storm events in conjunction with the Runoff Curve Number were used to calculate the peak discharge value at the downstream point of each sub-area and to develop a composite hydrograph downstream of the confluence between Still and Deep Creeks (Table 1). The discharge values computed using this method were compared with discharge values obtained from Discharge - Drainage Area Relationships developed for the Anacostia Basin (Reference 2), and values obtained from Multiple Regression Analysis (Reference 3).

Hydraulics

Analysis of the hydraulic characteristics of streams within the park were carried out to provide estimates of the elevation of the 10 and 100 year floods.

Cross sections were obtained from 1" = 200' topographic maps with 5 foot contours (Reference 4). No field survey information was available for this study.

Roughness coefficient (Manning's "N") for the creeks and the overbank areas were estimated on the basis of aerial photographic maps and field reconnaissance.

Water surface elevations were developed at each cross section utilizing the slope area method (Reference 5). Profiles were drawn for the 10 and 100 year floods, using the elevations determined at each cross section, between cross sections the elevations were interpolated (Figure 1). The 100 year flood plain has been delineated on the map.

References

1. U.S. Department of Agriculture, Soil Conservation Service NETSC Technical Note - Engineering - 20 1978.
2. S. Udhiri, Review and Analysis - Anacostia River Watershed, Publication 0764791560, 1978.
3. S. Udhiri, Magnitude and Frequency of Floods of Ungaged Maryland Streams, 1978.
4. Maryland-National Capital Park and Planning Commission, 1" = 200' topographic map with 5' contours, 1977.
5. V.T. Chow, Handbook of Applied Hydrology 1974.

(PRESENT CONDITION)

Creek Name	Sub-area No.	D.A (Sq.Miles)	R.C.N.	10 Yr,24 Hr Rainfall (in)	10 Yr,24 Hr Runoff(in)	100 Yr,24 Hr Rainfall(in)	100 Yr,24 Hr Runoff(in)	T_c (Hr)	T_t (Hr)
Still	A	1.07	71	5.3	2.34	7.4	4.06	2.5	0.25
	B	0.93	73	5.3	2.52	7.4	4.29	2.0	0
	C	0.21	72	5.3	2.43	7.4	4.17	0.8	0
	D	0.30	75	5.3	2.69	7.4	4.49	1.00	0
	E	0.21	75	5.3	2.69	7.4	4.49	0.9	0
	F	0.62	75	5.3	2.69	7.4	4.49	1.3	0
	G	1.05	78	5.3	2.98	7.4	4.85	2.2	0
Deep	AA	0.62	75	5.3	2.69	7.4	4.49	1.8	0
Below Still/Deep Confluence	Z	0.19	75	5.3	2.69	7.4	4.49	0.8	0

D E V E L O P E D

Creek Name	Sub-area No.	D.A (Sq.Miles)	R.C.N.	10 Yr,24 Hr Rainfall(in)	10 yr,24 Hr Runoff(in)	100 Yr,24 Hr Rainfall(in)	100 Yr,24 Hr Runoff (in)	T_c (Hr)	T_t (Hr)
Still	A	1.07	80	5.3	3.16	7.4	5.06	2.3	0.25
	B	0.93	80	5.3	3.35	7.4	5.29	1.8	0
	C	0.21	78	5.3	2.98	7.4	4.85	0.76	0
	D	0.30	80	5.3	3.16	7.4	5.06	0.91	0
	E	0.21	79	5.3	3.07	7.4	4.95	0.84	0
	F	0.62	80	5.3	3.16	7.4	5.06	1.2	0
	G	1.05	80	5.3	3.16	7.4	5.06	2.0	0
Deep	AA	0.62	82	5.3	3.35	7.4	5.29	1.67	0
Below Still/Deep Confluence	Z	0.19	80	5.3	3.16	7.4	5.06	0.8	0

10 YR. PROPOSED DEVELOPMENT CONDITION HYDROGRAPH AT CONFLUENCE OF STILL & DEEP CREEK

SUB-AREA	T_c (Hr)	T_t (Hr)	(Sq.Mi)	10 Yr. Runoff (In)	HYDROGRAPH DATA TIME - HOURS 12.3	12.5	12.7	12.9	13.0	13.2	13.4	13.6	13.8	14.0	14.2	14.4	14.6	14.8	15.0
G	2.2	0	1.05	3.16	318	382	550	613	637	630	611	561	497	428	375	326	288	256	226
F	1.3	0	0.62	3.16	433	517	522	469	425	345	310	227	188	159	135	115	102	92	82
E	0.9	0	0.21	3.07	196	203	177	138	120	94	73	59	49	41	35	32	29	26	23
D	1.0	0	0.30	3.16	289	298	260	203	176	137	107	87	72	60	52	47	42	39	34
C	0.8	0	0.21	2.98	244	204	145	103	88	67	53	43	37	32	28	26	23	22	21
B	2.0	0	0.93	3.35	299	417	517	573	593	592	573	526	468	401	352	306	271	239	211
A	1.8	0	0.62	3.35	199	278	345	382	399	395	382	351	311	268	234	203	181	159	141
A	2.5	0.25	1.07	3.16	133	191	258	323	356	412	440	465	465	450	426	391	356	321	285
Z	0.8	0	0.19	3.16	234	195	139	99	85	65	51	41	35	31	27	25	22	21	20
Cummulative Hydrograph Total			5.2		2345	2685	2913	2903	2884	2737	2600	2360	2122	1870	1664	1471	1314	1175	1043

10 YR. PRESENT CONDITION HYDROGRAPH BELOW CONFLUENCE OF STILL & DEEP CREEKS

SUB-AREA	T_c (Hr)	Tt (Hr)	D.A. (Sq.Mi)	10 Yr. Runoff (Inch)	HYDROGRAPH DATA TIME - HOURS 12.3	12.5	12.7	12.9	13.0	13.2	13.4	13.6	13.8	14.0	14.2	14.4	14.6	14.8	15.0
G	2.2	0	1.05	2.98	300	360	519	578	601	594	576	529	469	404	354	307	272	241	213
F	1.3	0	0.62	2.69	369	440	444	399	362	294	264	193	160	135	115	98	87	78	70
E	0.9	0	0.21	2.69	172	178	155	121	105	82	64	52	43	36	31	28	25	23	20
D	1.0	0	0.30	2.69	246	254	221	173	150	117	91	74	61	51	44	40	36	33	29
C	0.8	0	0.21	2.43	199	166	118	84	72	55	43	35	30	26	23	21	19	18	17
B	2.0	0	0.93	2.52	225	314	389	431	450	445	431	396	352	302	265	230	204	180	159
AA	1.8	0	0.62	2.69	160	223	277	307	320	317	307	282	250	215	188	163	145	128	113
A	2.5	0.25	1.07	2.34	113	163	220	275	303	351	378	396	396	383	363	333	303	273	243
Z	0.8	0	0.19	2.69	199	166	118	84	72	55	43	35	30	26	23	21	19	18	17
Cumulative Hydrograph Total			5.2		1983	2264	2461	2452	2435	2310	2197	1992	1791	1578	1406	1241	1110	992	881

100 YR PROPOSED DEVELOPMENT CONDITION HYDROGRAPH BELOW CONFLUENCE OF STILL & DEEP CREEKS

Sub - Area	T_c (HR)	T_t (HR)	D.A (Sq.mi)	100 Yr Runoff (in)	HYDROGRAPH DATA TIME HOURS 12.3	12.5	12.7	12.9	13.0	13.2	13.4	13.6	13.8	14.0	14.2	14.4	14.6	14.8	15.0
G	2.2	0	1.05	5.06	509	611	882	982	1020	1009	978	898	796	686	601	522	462	409	362
F	1.3	0	0.62	5.06	694	827	835	751	681	553	497	363	301	254	216	185	163	147	132
E	0.9	0	0.21	4.95	316	327	286	223	193	151	118	96	79	66	57	52	46	42	36
D	1.0	0	0.30	5.06	463	478	416	326	282	220	171	140	115	96	82	76	68	62	54
C	0.8	0	0.21	4.85	397	331	235	167	144	109	86	70	59	52	45	42	38	36	34
B	2.0	0	0.93	5.29	472	660	816	905	945	935	905	831	739	634	556	483	428	377	334
AA	1.8	0	0.62	5.29	315	438	544	603	629	623	603	555	491	423	370	320	285	252	220
A	2.5	0.25	1.07	5.06	221	319	430	538	593	686	739	774	774	749	710	651	593	534	476
Z	0.8	0	0.19	5.29	379	326	233	166	143	108	85	68	59	52	45	42	37	35	33
Cumulative Hydrograph Total			5.2		3766	4317	4677	4661	4630	4394	3779	3795	3413	3012	2686	2373	2120	1894	1681

100 YR PRESENT CONDITION HYDROGRAPH BELOW CONFLUENCE OF STILL & DEEP CREEKS

Sub - Area	T_c (HR)	T_t (HR)	D.A (Sq.mi)	100 YR Runoff (in)	HYDROGRAPH DATA TIME - HOURS 12.3	12.5	12.7	12.9	13.0	13.2	13.4	13.6	13.8	14.0	14.2	14.4	14.6	14.8	15.0
G	2.2	0	1.05	4.85	488	586	845	941	978	967	937	861	763	658	576	500	443	392	347
F	1.3	0	0.62	4.49	616	734	741	666	604	491	441	322	267	225	192	164	145	130	117
E	0.9	0	0.21	4.49	287	297	259	202	175	137	107	87	72	60	52	47	42	38	33
D	1.0	0	0.30	4.49	411	424	369	289	250	195	152	124	102	85	73	67	60	55	48
C	0.8	0	0.21	4.17	341	285	202	144	124	94	74	60	51	45	39	36	33	31	29
B	2.0	0	0.93	4.29	383	535	662	734	766	758	734	674	599	514	451	392	347	306	271
AA	1.8	0	0.62	4.49	267	372	462	512	534	529	512	471	417	359	314	272	242	214	187
A	2.5	0.25	1.07	4.06	196	283	382	477	526	609	656	687	687	665	630	578	526	474	422
Z	0.8	0	0.19	4.49	332	277	198	141	121	92	72	58	50	44	38	36	31	30	28
Cumulative Hydrograph Total			5.2		3321	3793	4120	4106	4078	3872	3685	3344	3008	2655	2365	2092	1869	1630	1482

WATER SURFACE ELEVATION COMPUTATION

DEEP CREEK

Cross Section AA-1

At Elevation 53 ft. M.S.L,

$A = 190$ sq. feet; $P = 100$ ft.

$R = \frac{A}{P} = \frac{190}{100} = 1.9$; $R^{2/3} = 1.53$

$S = 0.008$; $S^{1/2} = 0.09$

$N = 0.05$

$Q = \frac{1.4986}{N} AR^{2/3} S^{1/2} = \underline{\underline{780}}$ cfs.

At Elevation 52 ft. M.S.L,

$Q = \underline{\underline{397}}$ cfs.

Use Elevation 52.7 M.S.L.

Cross Section AA 2

At Elevation 65' M.S.L, $A = 180$; $P = 80$;

$R = \frac{180}{80}$; $R^{2/3} = 1.72$

$S = 0.007$; $S^{1/2} = 0.08$

$N = 0.05$

$Q = \underline{\underline{778 \text{ cfs}}}$

At Elevation 64' M.S.L, $Q = 453$ cfs

Use Elevation 64.5' M.S.L

Cross Section AA-3

At Elev.79' M.S.L,

$A = 150$; $P = 55$

$R = \frac{150}{55}$; $R^2/3 = 1.95$

$S = 0.009$; $S^1/2 = 0.096$

$N = 0.05$

$Q = 842$ cfs

At Elev.78' M.S.L, Q.= 530 cfs.

Use 78.4' M.S.L

Cross Section AA-4

At Elev. 103' M.S.L. 103', M.S.L,

$A = 160$; $P = 60$

$R = \frac{160}{60}$; $R^2/3 = 1.923$

$S = 0.013$; $S^1/2 = 0.114$

$N = 0.05$

$Q = 1049$

At Elev. 102', M.S.L.

$Q = 630'$

Use Elev. 102' M.S.L.

Below Still and Deep Creek's Confluence

Cross Section Z1

At Elevation 40' M.S.L

A = 500 sq. ft.; P = 240 ft.

R = 2.08; $R^{2}/3$ = 1.63

S = 0.005; $S^{1}/2$ = 0.07

N = 0.05

Q = 1697 cfs

At Elevation 41' M.S.L

A = 760, P = 250

R = 3.04; $R^{2}/3$ = 2.099

S = 0.005, $S^{1}/2$ = 0.07

Q = 3319 cfs

At Elevation 42' M.S.L

A = 1080; P = 290

R = 3.72; $R^{2}/3$ = 2.40

S = 0.005; $S^{1}/2$ = 0.07

Q = 5400 cfs

Use 41.8' M.S.L

Still Creek

Cross Section A-1

At Elevation 55' M.S.L.

A = 160; P = 70

R = 2.286; $2^{2/3}$ = 1.74

S = 0.07; $S^{1/2}$ = 0.265

Q = 2187 cfs

At Elevation 56' M.S.L

A = 250; P = 100

R = 2.5; $R^{2/3}$ = 1.84

Q = 3627 cfs.

Use Elevation 55.8' M.S.L.

Cross Section A-2

At Elevation 63' M.S.L.

A = 340; P = 120

R = 283; $R^{2/3}$ = 200

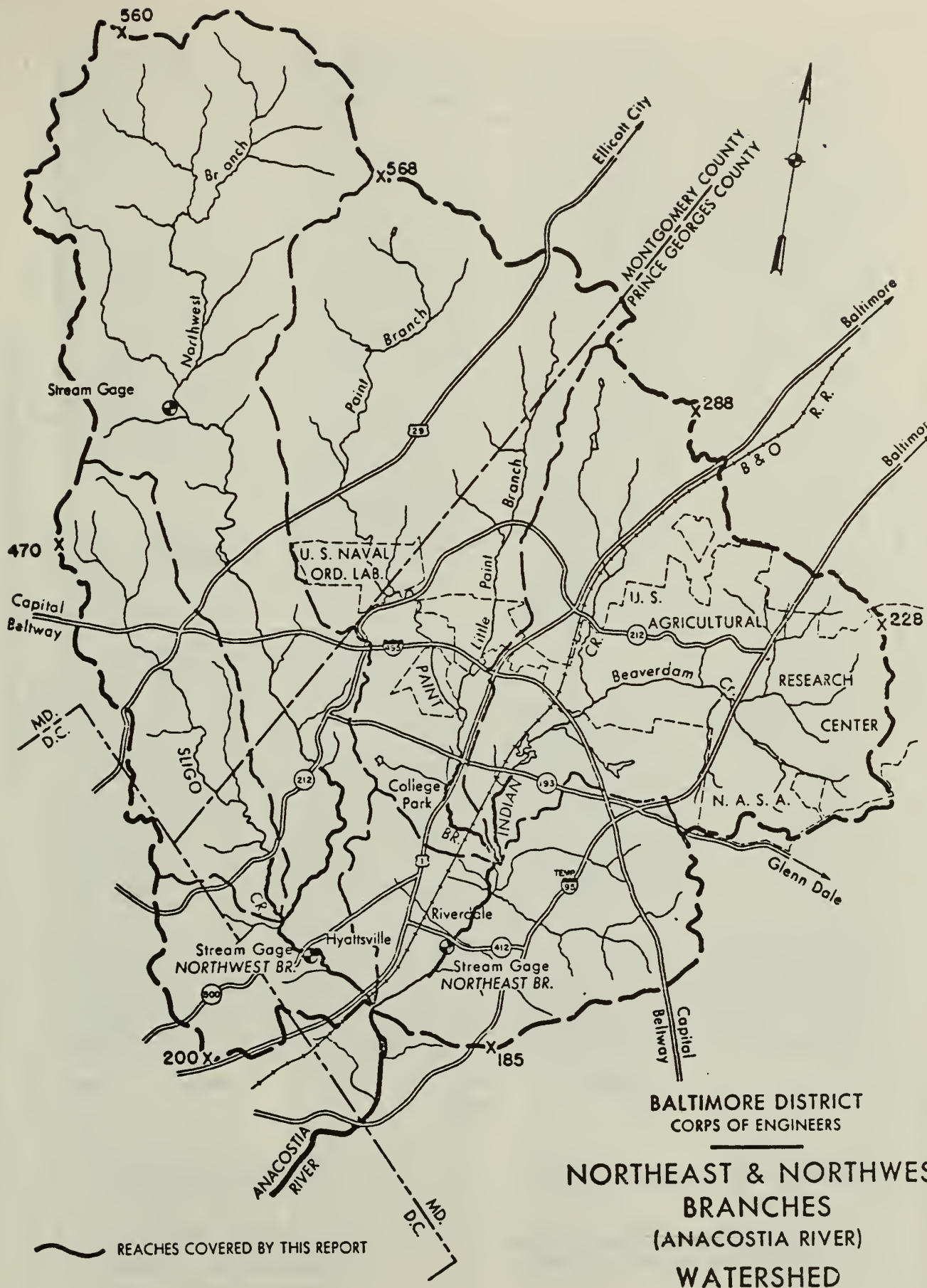
S = 0.004; $S^{1/2}$ = 0.63

Q = 1275 cfs

At Elevation 64' M.S.L

Q = 1850 cfs

At Elevation 65' = 2903 cfs Use 65' M.S.L

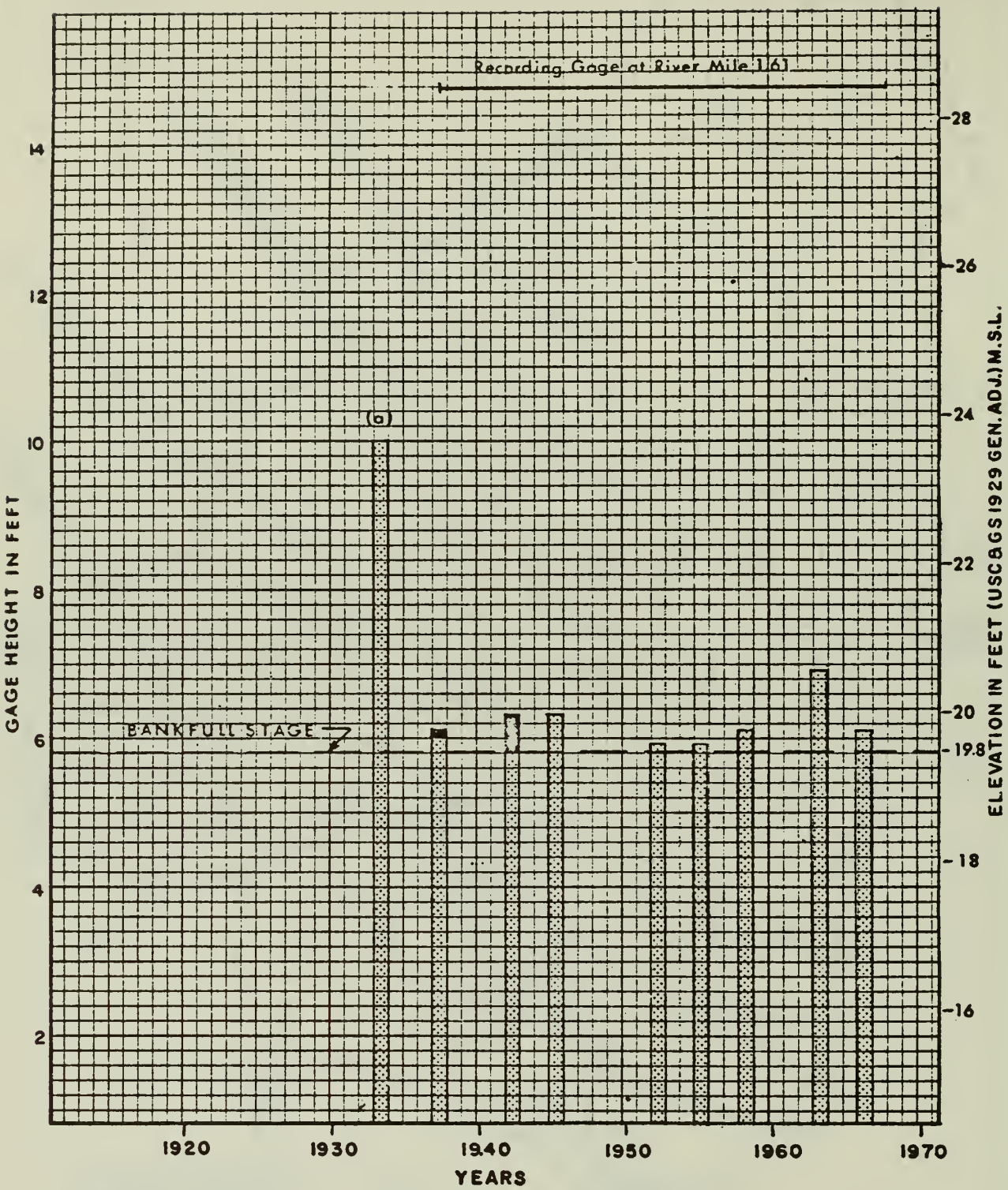


BALTIMORE DISTRICT
CORPS OF ENGINEERS

NORTHEAST & NORTHWEST BRANCHES (ANACOSTIA RIVER) WATERSHED

SCALE 1 0 1 2 MILES

JUNE 1968



(a) Stage for a recurrence of August 1933 Flood

Variation in shading on the bar graph indicates more than one flood during the year.

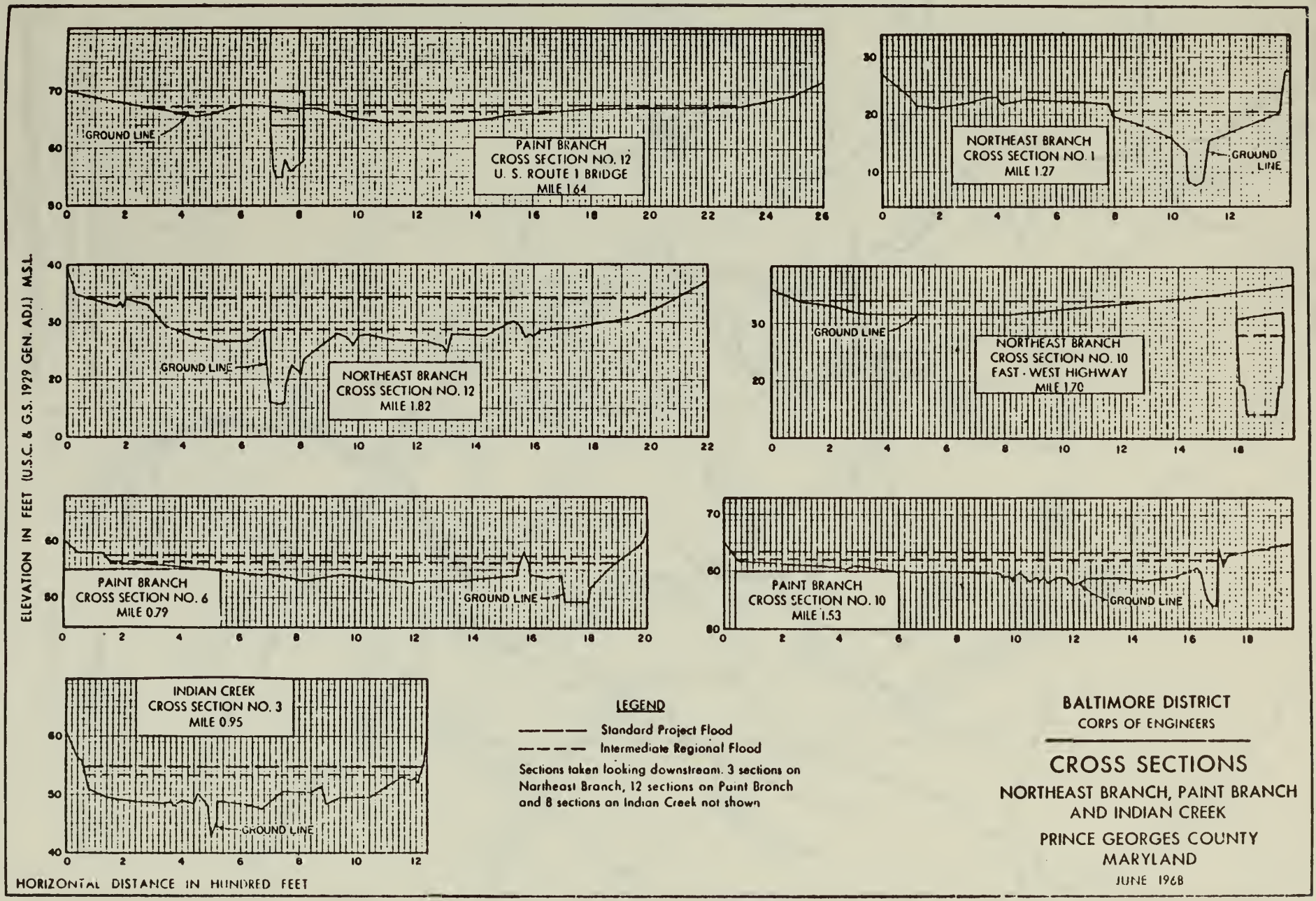
BALTIMORE DISTRICT
CORPS OF ENGINEERS

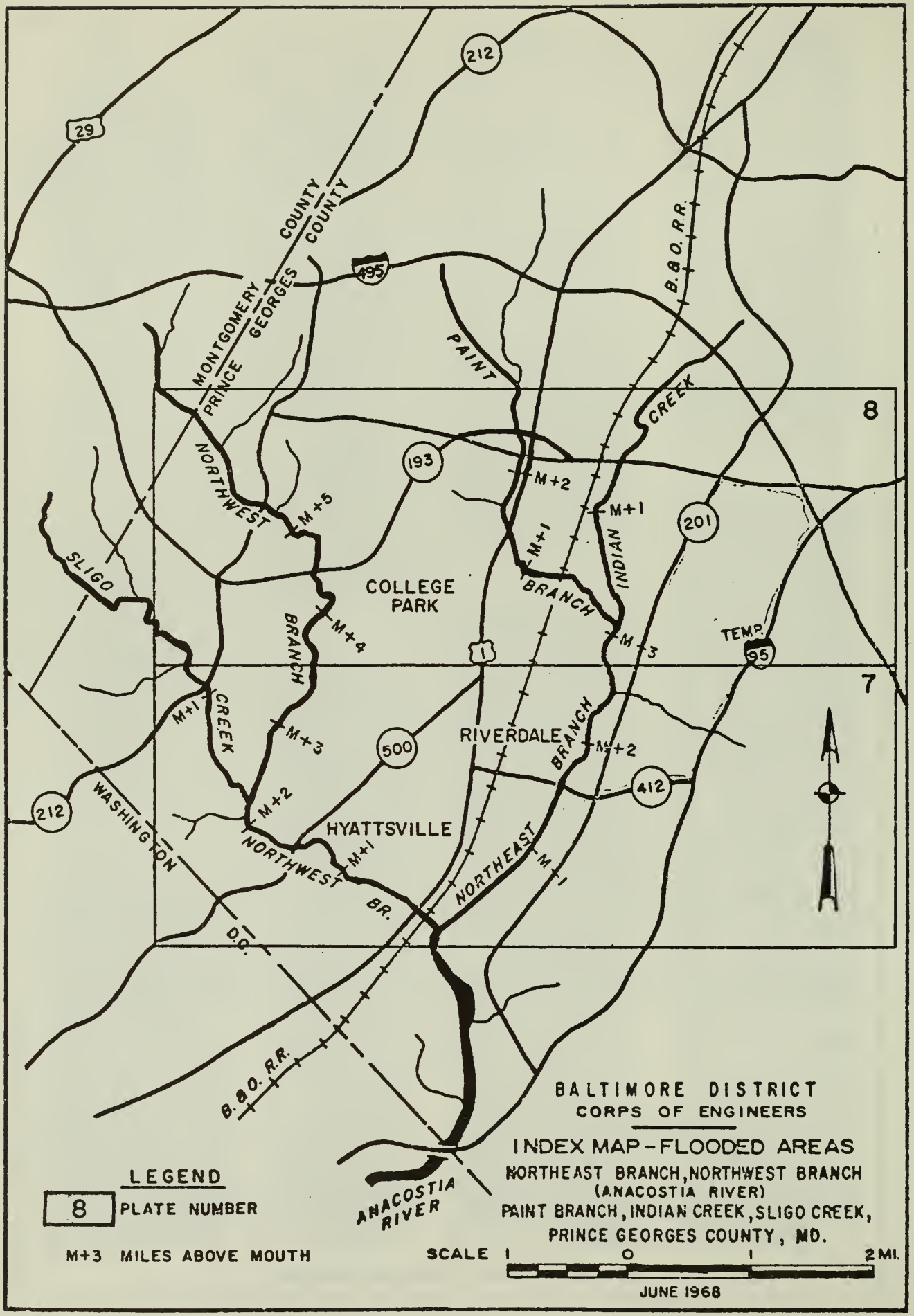
FLOODS ABOVE BANKFULL STAGE

NORTHEAST BRANCH

AT RIVERDALE, MD.

JUNE 1968


PAINT BRANCH
CROSS SECTION NO. 12
U. S. ROUTE 1 BRIDGE
MILE 1.64
GROUND LINE
NORTHEAST BRANCH
CROSS SECTION NO. 1
MILE 1.27
GROUND LINE
NORTHEAST BRANCH
CROSS SECTION NO. 12
MILE 1.82
GROUND LINE
NORTHEAST BRANCH
CROSS SECTION NO. 10
EAST - WEST HIGHWAY
MILE 1.70
GROUND LINE
PAINT BRANCH
CROSS SECTION NO. 6
MILE 0.79
GROUND LINE
PAINT BRANCH
CROSS SECTION NO. 10
MILE 1.53
GROUND LINE
INDIAN CREEK
CROSS SECTION NO. 3
MILE 0.95
GROUND LINE
ELEVATION IN FEET (U.S.C. & G.S. 1929 GEN. ADJ.) M.S.L.
HORIZONTAL DISTANCE IN HUNDRED FEET
LEGEND
Standard Project Flood
Intermediate Regional Flood
Sections taken looking downstream. 3 sections on Northeast Branch, 12 sections on Paint Branch and 8 sections on Indian Creek not shown
BALTIMORE DISTRICT
CORPS OF ENGINEERS
CROSS SECTIONS
NORTHEAST BRANCH, PAINT BRANCH AND INDIAN CREEK
PRINCE GEORGES COUNTY
MARYLAND
JUNE 1968


212
29
MONTGOMERY COUNTY
PRINCE GEORGES COUNTY
495
B.&O. R.R.
PAINT
CREEK
8
193
M+2
M+1
201
NORTHWEST
M+5
SLIGO
INDIAN
M+1
BRANCH
COLLEGE PARK
BRANCH
M+4
M+3
TEMP.
95
1
7
M+1
CREEK
M+3
500
RIVERDALE
BRANCH
M+2
412
212
WASHINGTON
M+2
HYATTSVILLE
NORTHWEST
M+1
BR.
NORTHEAST
M+1
D.C.
B.&O. R.R.
ANACOSTIA RIVER
LEGEND
8 PLATE NUMBER
M+3 MILES ABOVE MOUTH
BALTIMORE DISTRICT
CORPS OF ENGINEERS
INDEX MAP - FLOODED AREAS
NORTHEAST BRANCH, NORTHWEST BRANCH
(ANACOSTIA RIVER)
PAINT BRANCH, INDIAN CREEK, SLIGO CREEK,
PRINCE GEORGES COUNTY, MD.
SCALE 1 0 1 2 MI.
JUNE 1968

APPENDIX G:

SOILS REPORT

SOILS

The soils of Greenbelt Park are in part composed of the Christiana-Sunnyside Beltsville association and consist of deep, level to steep, well-drained, sandy and clayey soils and level to sloping, moderately deep, moderately well drained soils that have a compact subsoil. This association is in the northern part of the county. It adjoins the District of Columbia on the west and the flood plain of the Patuxent River on the east.

The following is from the Soil Survey, Prince George's County, Maryland:

> Christiana soils make up about 26 percent of the association; the Sunnyside soils, about 20 percent; the Beltsville soils, about 20 percent; and minor soils, about 34 percent. This association occupies about 15 percent of the county.
>
> In this association the underlying material is dominantly red clay. The Christiana soils formed on this material. Along with the Christiana soils, and on essentially the same kind of clay, the small areas of the somewhat excessively drained Muirkirk soils. The Christiana soils are red, deep, and well drained, but moisture moves slowly through them. The Sunnyside soils are also red, deep, and well drained, but they have a less clayey, more permeable subsoil than the Christiana soils. The moderatley well drained Beltsville soils have a dense, almost impermeable subsoil.
>
> Locally important minor soils in this association are the somewhat excessively drained Galestown and Evesboro soils, the well drained Sassafras soils, the moderately well drained Keyport and Woodstown soils, and the poorly drained Elkton and Fallsington soils.
>
> Except at the U.S. Department of Agriculture Research Center at Beltsville, little of this association is used for farming. Much of it is in second-growth hard-woods and pines at various stages of maturity. Most of the soils are not naturally fertile. Because this association lies between Washington, D.C., and Baltimore, Maryland, much of it has been used for residential and industrial development. This development is limited on the Sunnyside soils only in those areas where slopes are strong or steep. Septic tanks do not function well on the Christiana soils, and they function hardly at all on the Beltsville soils. Other residential uses are also severely limited on the Christiana soils by their clay subsoil. The Christiana soils as well as the minor Muirkirk soils and Silty and clayey lands, are unstable when they are saturated, especially if their soil material has been moved, graded, or otherwise disturbed. These soils tend to cave, slump, and flow when they are wet or are under the load of buildings, roads, or other structures. Upon drying, the soil material may shrink away from footings and foundations. On-site engineering surveys and studies should be made where heavy permanent installations are proposed on the soils of this association.

CHRISTIANA SERIES

The Christiana series consists of deep, well-drained silt loams, clays, and fine sandy loams on the higher part of the Coastal Plain uplands. These soils have a clay subsoil and developed in thick beds of very old red clay that, in places are covered with a very thin mantle of silty or sandy materials. The Christiana soils are moderately sloping or strongly sloping in most areas, but slopes range from gentle to fairly steep.

The Christiana soils are extensive in Prince George's County. They coour mostly in the northern and western parts of the county, north of a line extending roughly between District Heights and Priest Bridge. Because of their location and distribution, these soils are becoming more important for community development than for farming. The native vegetation is upland hardwoods, mainly oak, but in some places it is Virginia pine.

Christiana Clay, 5 to 10 percent slopes, Severely Eroded. (CcC3). This soil is typical of Christiana soil that occur in areas where all or nearly all of the orginal surface soil has been lost through eroision. The clay surface layer is much redder than the original surface soil of Christiana soils. In places gullies, some of them deep, have formed.

Included in mapping were a few areas that have thin lenses of glauconite, or greensand, in their lower subsoil. These soils are easily eroded.

Christiana Fine Sandy Loam, 2 to 5 percent slopes, Moderately Eroded. (CdB2). Except that it is coarser textured and somewhat thinner, this soil is like the soil described for the series. The risk of erosion if moderate. Some areas are uneroded, and some are severely eroded. Included in mapping were a few areas where shallow gullies have formed, a few spots where the surface layer is somewhat coarser than normal, and some areas where lenses of greensand, or qlauconite, occur in the lower subsoil.

Because the clay in the subsoil absorbs water slowly, runoff is moderately rapid and erosion is likely after the sandy surface layer is saturated. Special practices are needed for controlling erosion.

Christiana Fine Sany Loam, 5 to 10 percent slopes, Moderately Eroded. (CdC2). This sloping soil is very susceptible to erosion because the surface soil is sandy and the subsoil is clay. Some areas are uneroded, and a few are only slightly eroded.

Also included were a few areas that have thin layers of greensand, or glauconite, in the subsoil.

Because clay subsoil absorbs water slowly, runoff is moderately rapid after the sandy surface layer is saturated. Intensive practices are needed to control erosion.

Christiana-Urban Land Complex, 5 to 15 percent slopes. (CfC). This complex is steeper than Christiana-Urban land complex, 0 to 5 percent slopes, and it contains more disturbed land. The Christiana soils have been graded, terraced, or generally rearranged for community development. Buildings, streets, and sidewalks occupy from 10 to 40 percent of the mapping unit.

About 10 percent of each area mapped as this complex consists of Christiana soils like the soil described for the series. About 50 percent consists of Christiana soils that have been severely disturbed or altered by machines. In these areas the severely disturbed Christiana soils are covered with as much as 18 inches of soil material or have had as much as two-thirds of the original soil profile removed. Nearly 40 percent of the acreage consists of land fills, 18 inches or more thick, or areas where most of the Christiana soil profile has been cut away. The surface layer of the severely disturbed areas has variable texture and may be a mixture of sand, silt, and clay in any proportion.

Christiana Fine Sany Loam, 10 to 15 percent slopes, Moderately Eroded. (CdD2). Because this strongly sloping soil has a sandy surface soil and a clay subsoil, the erosion hazard is serious. Some areas, however, are uneroded or only slightly eroded.

Christiana Silt Loam, 2 to 5 percent slopes, Moderately Eroded. (CeB2). Except that its surface layer is thinner, this soil si like the one described for the Christiana series.

Because slopes are gentle, the risk of erosion is moderate. Some areas are uneroded, and a few are severely eroded. Gullies, a few of them deep, have formed in some fields.

Runoff tends to be rapid because water moves through this soil slowly. Runoff and erosion can be controlled by using sodded waterways and diversion terraces on long slopes.

Christiana Silt Loam, 5 to 10 percent slopes, Moderately Eroded. (CeC2). The surface layer of this soil is dominantly silt loam, but in places it contains an appreciable amount of fine sand. Some areas are uneroded or only slightly eroded.

Christiana Silt Loam, 10 to 25 percent slopes, Moderately Eroded. (CeD2). Except that it is steeper, this soil is like Christiana silt loam, 2 to 5 percent slopes, moderately eroded. Some areas are uneroded or only slightly eroded. In places the surface contains an appreciable amount of fine or coarse sand.

SUNNYSIDE SERIES

The Sunnyside series consists of deep, well-drained soils that developed in fine sandy sediments, which contain a considerable amount of reddish clay. These soils occupy nearly level to steep uplands on the Coastal Plain, mainly in the northwestern part of the county between the District of Columbia and the Howard County line.

The Sunnyside soils are like the Sassafras soils but are distinctly redder in color and are normally thicker. They are not so intensely red as the Christiana soils, which are commonly nearby, and are more sandy throughout.

The Sunnyside soils are farily extensive in Prince George's County and occur mostly in the northwestern part of the county. Except for slope and the hazard of erosion, Sunnyside soils have no specific limitations for use in residential areas. The native vegetation is chiefly upland oak and other hardwoods, and there are some Virginia pines.

Sunnyside Fine Sandy Loam, 0 to 5 slopes, Moderately Eroded. (StB2). This soil is like the one described for the Sunnyside series. The risk of erosion is moderate. Sodded waterways are needed to help control erosion.

Sunnyside Fine Sandy Loam, 5 to 10 percent slopes, Moderately Eroded. (StC2). Except for steeper slopes, this soil is like Sunnyside fine sandy loam, 0 to 5 percent slopes, moderately eroded. Some areas are uneroded or only slightly eroded, but in many places shallow gullies have formed.

This soil is suited to most general crops. It holds a good supply of moisture for plants, but it may be somewhat droughty during long dry periods. Sodded waterways are needed to help control erosion.

Sunnyside Fine Sandy Loam, 10 to 15 percent slopes, Moderately Eroded. (StD2). This soil is too sloping to be safe for regular cultivation. If conservation measures are carefully applied, a cultivated crop can be safely grown about once in 5 years if the soil is kept under a cover of protective plants the rest of the time.

Sunnyside Fine Sandy Loam, 15 to 30 percent slopes. (StE). This soil is good for use as woodland and for wildlife habitats.

Sunnyside Loam, 0 to 5 percent slopes, Moderately Eroded. (SuB2). This soil contains more silt and less sand in the horizons than the soil described for the series. The risk of erosion is moderate. Waterways should be kept in sod.

Sunnyside Sandy Clay Loam, 5 to 10 percent slopes, Severely Eroded. (SvC3). This soil has lost all or nearly all of its original surface layer through erosion. In most places the surface layer now is reddish brown, rather firm, and sticky. This soil is fairly difficult to manage.

BELTSVILLE SERIES

The Beltsville series consists of moderately well-drained soils that have only moderate effective depth to a thick, very fragipan in the lower subsoil. This pan is densely packed, but it is not cemented. Locally, it is called hardpan, or foolish earth. The Beltsville soils developed in silty to sandy materials that probably were deposited by wind over old alluvium. This alluvium is generally sandy, but it is gravelly in places. These soils occur mainly on level to gently sloping uplands, though some areas are fairly steep.

The fragipan in the Beltsville soils is very slowly permeable. Consequently, these soils have a water table that is temporarily perched above the fragipan in wet season. The fragipan and the IIC horizon below the temporary water table frequently are very dry or only slightly moist.

The Beltsville are moderately well drained soils on the same kind of material as the well drained Chillum soils and the poorly drained Leonardtown soils. This material is similar but shallower and less silty than the underlying moderately well-drained Butlertown soils. On deposits of silt underlain by looser, sandier deposits than those underlying the Beltsville soils, there are the well drained Matapeake soils, the moderately well drained Mattapex soils, and the poorly drained Othello soils.

Special problems occur on these soils in residential areas, particularly in areas without sewerage systems. The native vegetation is mainly hardwoods, but in some places it is Virginia pine.

Beltsville Fine Sandy Loam, 2 to 5 percent slopes, Moderately Eroded. (BeB2). This soil has better surface drainage than Beltsville fine sandy loam, 0 to 2 percent slopes, but it is more susceptible to erosion. The surface layer is dominantly of fine sand, but in places this layer contains a considerable amount of medium and coarse sand. In some places this soil is thin or shallow to the underlying fragipan. Included in the mapping were a few areas that are wetter than normal. Also included were places where the upper part of the subsoil is somewhat reddish.

Erosion is the most important problem in managing this soil. Surface drainage can be improved and erosion checked by planting crops in graded strips and using diversion terraces. The drainageways should be kept in sod.

Beltsville Silt Loam, 2 to 5 percent slopes, Moderately Eroded. (BIB2). This is the most extensive soils in the county. It is well distributed on all the smooth uplands of the county except those in the central part, where the soils that developed from greensand are dominant. Because this soil is sloping, erosion is a greater problem of management than drainage.

The surface layer is a mixture of the original silty surface soil and some of the finer subsoil material. In some areas this soil is uneroded or only slightly eroded, and in a few areas it is severely eroded. In these severely eroded areas, the fragipan is near the surface. Gullies, some of them deep, have formed in places. Included in the mapping were areas where the surface layer contains a considerable amount of sandy material. Also included were some spots that are gravelly and a few places where the subsoil is redder than normal.

Runoff is rapid because this soil has a dense subsoil imperfect drainage, and gentle slopes. Contour strips, supported by diversion terraces and sod waterways, help to control runoff and erosion.

Beltsville Silt Loam, 5 to 10 percent slopes, Moderately Eroded. (BIC2). Except for steeper slopes, this soil is like Beltsville silt loam, 2 to 5 percent slopes, moderately eroded. Protecting the soil from erosion is a greater problem of management than drainage. The surface layer is a mixture of the original silty surface soil and some of the sticky subsoil material. In some places this soil is uneroded or only slightly eroded. A few shallow gullies have formed in some areas.

This soil is suited to most general crops, but its use is limited by a thin root zone and slow internal drainage.

Additional soils found in Greenbelt Park include the following:

AURA SERIES

The Aura series consists of well-drained gravelly soils that have a red subsoil and are deep to very gravelly, very firm materials. These soils have developed on old deposits of sandy and clayey gravel. The Aura soils are sloping to moderately steep. They occur mostly in bluff-like areas that are rough parallel to the Potomac River.

The Aura soils are fairly extensive, particularly in the southwestern part of the county. They have a fairly thin root zone and are somewhat droughty during extended dry periods. The Aura soils are in areas where residential development is rapid. In most places these soils provide an excellent source of gravel for road and other construction.

The native vegetation chiefly oak, but other hardwoods are common. Virginia pine grows in many areas.

Aura and Croom gravelly loams, 20 to 50 percent slopes. (AvE). This mapping unit consists of the steepest areas of the Aura and the Croom soils that occur in the county. The Aura soils are redder than the Croom soils, but in other characteristics the two soils are similar. Areas mapped as these soils may contain either Aura gravelly loam or Croom gravelly loam, but generally these areas do not contain both.

These steep and very steep soils are not suitable for cultivation. Many areas are severely eroded. The most intensive use suitable for this soil is woodland or limited grazing.

BIBB SERIES

The Bibb series consists of deep, level or nearly level, poorly drained soils on flood plains along streams of the Coastal Plain. These soils are made up of materials that were washed from silty and sandy uplands and recently deposited along many of the major streams and drainageways in the county.

The Bibb soils are extensive in Prince George's County. Most areas are subject to flooding. Residential use is limited by flooding and poor drainage. Some areas have been made into parks and playgrounds, and other areas are suitable for these uses. Most areas of this soil are in forest consisting of maple, gum, oak, and other hardwoods that tolerate wetness.

Bibb Silt Loam. (Bo). Except for the silt loam surface layer about 3 feet thick, this soil is like the one described for the Bibb series. It is one of the most extensive mapping units in Prince George's County. It feels floury when dry and is somewhat sticky when wet. In a few areas the surface layer contains medium-sized sand and feels gritty. Most areas of this soil are nearly level, though a few small areas are gently sloping.

This poorly drained soil is wet for long periods. It is somewhat more difficult to drain and to work than the Bibb sandy loam. Either ditches or tile can be used for drainage if outlets are adequate. These soils are not susceptible to erosion. In areas where this soil is subject to frequent flooding, use is limited mostly to grazing, woodland, wildlife, or recreation.

CHILLUM SERIES

The Chillum series consists of moderately deep, well-drained soils on uplands of the Coastal Plain. These soils developed in a mantle of thin, wind-deposited silty to somewhat sandy

materials that are underlain by older deposits of very hard sandy and gravelly material. Most areas of the Chillum soils are gently sloping to moderately sloping, but some areas are nearly level and some are steep.

The Chillum soils are fairly extensive in the county. They are fairly important to farming, but a large acreage is in areas of rapid development for residential use. The native vegetation is upland hardwoods, mainly oak, but in several areas much of it is Virginia pine.

Chillum Silt Loam, 0 to 6 percent slopes, Moderately Eroded. (CaB2). This is the soil described for the Chillum series. In most areas slopes range from 2 to 6 percent. In a few scattered areas, erosion has been severe. Gullies, some of them deep, have formed in places. Use of this soil is limited by a thin root zone, a small capacity for storing moisture, and droughtiness in long dry periods. The hazard of erosion also limits use.

Chillum Silt Loam, 6 to 12 percent slopes, Moderately Eroded. (CaC2). Except that it is more sloping and thinner, this soil is like the one described for the series. The plow layer is a mixture of the original surface soil and some of the sticky subsoil material. Some areas are uneroded or only slightly eroded, but in a few areas some gullies have formed.

Erosion is the most important problem of management, but seasonal droughtiness and a restricted root zone also influence management, use, and yield. Erosion can be controlled by using contour or graded strips and other conservation measures. Waterways should be kept in sod.

ELKTON SERIES

The Elkton series consists of poorly drained, nearly level to gently sloping soils on upland flats. These soils developed in beds of acid clay and silty clay of the Coastal Plain. They have a gray, highly clayey subsoil through which water moves very slowly.

In Prince George's County, the A horizon of Elkton soils is silt loam or fine sandy loam. In areas where the texture is fine sandy loam, the A horizon consists of nonconforming overwash material that is not genetically related to the B horizon. The B1 and B2 horizons are generally clay or silty clay.

Elkton Silt Loam. (Ek). This soil is the one described for the Elkton series. It is nearly level to gently sloping. In most places the surface layer feels floury when it is dry, and it is somewhat sticky when wet. In some places this layer contains fine sand and feels slightly gritty. Included in mapping were some areas that have a gray, sticky clay surface layer and other areas where the surface layer is a mixture of dark olive-green sticky clay and fine sand.

Drainage is a major problem of management on this soil. Tile is not suitable for drainage, and ditches must be closely spaced. A few areas are in community developments.

ELSINBORO SERIES

The Elsinboro series consists of deep, well-drained soils that developed in old alluvium along streams. Areas of these soils were once flood plains, but they are now benchlike areas of terraces well above the normal flood stage because the streams have cut downward. The alluvium originally was washed from soils on the Piedmont and commonly contains a considerable amount of fine mica. The Elsinboro soils are nearly level to gently sloping in most places but are moderately sloping in a few places.

The Elsinboro soils are not extensive in this county. They occur only on old alluvium terraces in the northern and northwestern parts of the county where major streams have washed material from the Piedmont and mixed it with sedimentary material of the Coastal Plain. In most places, however, they occur in developed areas, particularly in Bladensburg, Hyattsville, Riverdale, and College Park, and on the broad terraces along the various branches of the Anacostia River.

Elsinboro Sandy Loam, 2 to 5 percent slopes, Moderately Eroded. (EnB2). This soil is typical of Elsinboro soils that occur in areas where the surface layer is sandy loam. Silvery flakes of mica occur throughout the profile. In many areas this soil is shallower to the underlying material than normal and in a few areas the surface layer contains some of the brown, sticky subsoil material. In a few spots a considerable amount of gravel is in the surface layer, and in some areas there are a few shallow gullies. Limitations for non-farming uses are few.

FALLSINGTON SERIES

The Fallsington series consists of poorly drained soils that have a gray subsoil through which water moves readily. These soils are on the Coastal Plains, where they developed on old sandy deposits containing moderate amounts of silt and clay. They occur on uplands, chiefly in nearly level areas. Some areas are gently sloping to moderately sloping.

Poor drainage is a special problem if they are used as residential areas. The native vegetation is hardwoods that tolerate wetness.

Fallsington Sandy Loam. (Fs). Most of this soil is level or nearly so, but a few areas are more sloping.

Wetness is the most important problem of management. This soil has severe limitations for most nonfarm uses.

GALESTOWN SERIES

The Galestown series consists of very deep, very sandy, somewhat excessively drained to excessively drained soils that developed in very sandy

materials. These soils probably have been reworked by wind and by water. They have a highly colored, normally strong-brown subsoil. These level to steep soils commonly are near but well above streams and drainageways.

The Galestown soils are not extensive in this county. Most areas are adjacent to the larger streams and rivers. These soils tend to be droughty. Special fertility and management practices may be needed in residential areas to establish and maintain lawns and ornamental plants of high quality. The native Galestown-Evesboro loamy sands, 0 to 8 percent slopes. Included in mapping were some spots that are gravelly and a few areas where gullies have formed.

The soils are not suitable for cultivation. They are suited to trees, to limited grazing, or as wildlife habitats.

Galestown-Evesboro Loamy Sands, 0 to 8 percent slopes. (GeB). This complex consists of areas of Galestown soils and Evesboro soils that are so intricately intermingled that it is not practical to separate the soils on a map of the scale used. Each soil is like the one described for its respective series. Included in mapping were a few spots that are gravelly and areas where a few shallow gullies have formed.

These coarse, loose, droughty soils are severely limited for farming. The surface should be protected by plants at all times so as to prevent washing and blowing.

Galestown-Evesboro Loamy Sands, 8 to 15 percent slopes. (GeC). Except for steeper slopes, this complex is like vegetation it consists of scrub hardwoods in stands that Virginia pine has strongly invaded.

GRAVEL AND BORROW PITS

This miscellaneous land type consists chiefly of areas where soil material has been removed for use in highway construction or for other purposes and of larger areas that have been stripped for mining gravel or sand.

Gravel and Borrow Pits. (Gp). Gravel and borrow pits account for 2,790 acres in the county, and as construction continues, more areas are likely to be created. Although these areas are no longer suited for farming or other normal purposes, some of them can be planted to grass or to shrubs and trees. For most purposes, these areas require intensive or drastic reclamation that includes filling and grading and, in some places, establishing drainage outlets. Some pits could be filled with refuse and covered with clean soil material; other pits could be converted into ponds. After these improvements have been made, many areas of this unit might be suitable as a wildlife habitat or as a recreation area.

EVESBORO SERIES

The Evesboro series consists of a very deep, sandy, somewhat excessively drained to excessively drained soils. These soils developed in sandy materials that probably were reworked by wind and possibly by water. The Evesboro soils are of a yellowish color and occur on nearly level to fairly steep uplands of the Coastal Plain.

The Evesboro soils are on the same kinds of material as the Galestown soils, which are of a stronger and brighter brown.

The Evesboro soils are very low in fertility and tend to be droughty. Excess water is not a problem in residential areas, but special care is needed in establishing and maintaining lawns and ornamental plants. The native vegetation consists of scrub hardwoods and a considerable number of Virginia pines.

IUKA SERIES

The Iuka series consists of nearly level to moderately sloping, moderately well drained soils on flood plains, in depressions, on foot slopes, and around the head of drains. These soils are on the Coastal Plain. They consist of recently deposited materials that wash from silty and sandy uplands.

The Iuka soils occur in many parts of the county. They are in a few fairly large areas of the flood plains and in many small scattered depressions. These small areas are important to landowners. The native vegetation consists mainly of mixed hardwoods, but in many places the stand contains yellow-poplar.

Iuka Fine Sandy Loam. (Ik). This soil has the profile described for the Iuka series. Most areas are nearly level, but some are gently sloping. This soil occupies the flood plain of streams.

Poor drainage and the hazard of flood limit the use of this soil. In most places drainage is the most important problem of management. Drainage can be improved by using either V-type drains or tile.

Iuka Sandy Loam, Local Alluvium, 0 to 2 percent slopes (ImA).--This soil is coarser textured than Iuka fine sandy loam. It is nearly level upland depressions that have drainage outlets, and it is generally not subject to flooding.

Drainage is the most important problem of management. Tile is suitable for imporving drainage, but ditches should be used to intercept runoff and seepage from adjacent higher soils.

Iuka Sandy Loam, Local Alluvium, 2 to 5 percent slopes (ImB).-- This soil is on foot slopes and the sloping sides of depressions.

Drainage is normally a more important problem of management than erosion. Tile lines are needed, along with ditches that intercept runoff and seepage from adjacent areas.

Iuka Silt Loam (In). This soil is on the flood plain of streams and is flooded occasionally. Most of this soil is level or nearly level, but a few areas that have gentle slopes were included.

Wetness is the major problem of management on this soil, and there is a hazard of flooding. V-type ditches are commonly used to improve drainage.

Iuka Silt Loam, Local Alluvium, 2 to 5 percent slopes (IoB).--This soil has somewhat stronger slopes than Iuka silt loam, local alluvium, 0 to 2 percent slopes.

Although erosion is a hazard on this soil, drainage is the most important problem of management. In most places ditches are needed to intercept runoff and seepage from adjacent higher areas.

KEYPORT SERIES

The Keyport series consists of deep, moderately well drained soils that have a fine-textured subsoil. The subsoil is mottled in the lower part, and water moves through it slowly or very slowly. These soils developed in thick beds of clay or fine silty clay on the Coastal Plain. The Keyport soils are on nearly level to strongly sloping uplands.

Seasonal wetness, a fine-textured subsoil, and very slow permeability are problems in developing residential areas. The native vegetation consists of mixed upland hardwoods and a few pines.

Keyport Fine Sandy Loam, 2 to 5 percent slopes, Moderately Eroded (KeB2).-- Except for stronger slopes and more erosion, this soil is like Keyport fine sandy loam, 0 to 2 percent slopes. Although drainage may be needed, the risk of erosion is the most critical problem of management. Carefully sodded waterways help to prevent washing and gullying. This soil is not difficult to work.

Keyport Fine Sandy Loam, 5 to 10 percent slopes, Moderately Eroded (KeB2). This soil, which has a thick sandy surface layer over a tight clay subsoil, is more susceptible to erosion then Keyport fine sandy loam, 2 to 5 percent slopes, moderately eroded, because slopes are stronger and runoff is more rapid. The surface layer varies in thickness. The control of erosion is the most important problem in managing this soil.

Keyport Silt Loam, 0 to 2 percent slopes. (KpA). This is the soil described for the Keyport series. The surface layer feels soft and floury, though in spots it is slightly gritty.

Because water moves slowly through the subsoil, drainage is impeded.

Keyport Silt Loam, 2 to 5 percent slopes, Moderately Eroded. (KpB2). This soil is more sloping and more eroded than Keyport silt loam, 0 to 2 percent slopes. Runoff is more rapid, and the hazard of erosion is greater. In a few areas this soil is only slightly eroded, but in other places a few shallow gullies have formed. In spots, deep plowing has turned up some subsoil material and mixed it into the surface layer. Because drainage is impeded and water penetrates slowly into the soil, runoff tends to be excessive, especially when the soil is wet. Controlling the erosion is generally more necessary than improving drainage.

Keyport Silt Loam, 5 to 15 percent slopes, Moderately Eroded. (KpC2). This soil is steeper than Keyport silt loam, 2 to 5 percent slopes, moderately eroded, and more careful management is required to control erosion.

Keyport-Urban Land Complex, 0 to 10 percent slopes. (KuB). This complex consists of Keyport soils and disturbed land that is mainly of Keyport soil material. These soils are used for community developments. From 15 to 20 percent of each area mapped as this complex consists of Keyport soils that have a silt loam or fine sandy loam surface layer. About 50 percent consists of Keyport soils that have been covered with as much as 18 inches of fill material or has had as much as two-thirds of the original soil profile removed. The rest is land areas covered with fill material, more than 18 inches thick, or areas where nearly all of the Keyport soil profile has been cut away. The fills have variable texture, and the exposed cuts are rich in clay in most places.

MARR SERIES

The Marr series consists of deep, well-drained soils that developed in old deposits of fine sandy to very fine sandy materials containing a considerable amount of silt and clay. The sand particles in the Marr soils are especially fine and of uniform size. The Marr soils occur on the higher uplands of the Coastal Plain. They generally range from nearly level to rolling, but some areas are steep.

Most areas have been farmed since early colonial times, but some areas are now used for community development. The native vegetation consists mainly of mixed upland hardwoods, but Virginia pine grows in many areas.

Marr Fine Sandy Loam, 20 to 35 percent slopes. (MIE). This steep soil is gullied in places. The fullies are many, and some of them are deep.

Most areas of this soil are still wooded and probably should remain so. Sodding benefits cleared areas and provides limited grazing or forage. Planting of trees is also beneficial. Steepness severely limits the nonfarm uses of this soil.

MATAWAN SERIES

The Matawan series consists of deep, moderately well drained soils that have a thick, sandy durface layer and a clayey subsoil through which water moves slowly. These soils developed in a sandy mantle over older clayey deposits. They are on nearly level to moderately sloping uplands of the Coastal Plain.

Matawan Fine Sandy Loam, 5 to 10 percent slopes, Moderately Eroded. (MrC2). The erosion hazard is more severe on this strongly sloping soil than it is on Matawan fine sandy loam, 2 to 5 percent slopes moderately eroded. Consequently, better protective measures are needed to keep this soil suitable for continued use.

MATTAPEX SERIES

The Mattapex series consists of deep, moderately well drained soils through which water moves readily to somewhat slowly. These soils developed in a thin mantle of wind-developed silt and very fine sand underlain by older deposits of sandy and, in places, gravelly material. The Mattapex soils are on nearly level to moderately sloping uplands of the Coastal Plain.

Mattapex soils are limited by slope, erosion hazard, and to some degree, wetness and impeded drainage. Seasonal wetness limits the Mattapex soils for use in community development.

Mattapex Silt Loam, 2 to 5 percent slopes, Moderately Eroded. (MuB2). The surface layer of this silty soil generally feels soft and floury when it is dry, but in some places it contains coarse material and feels slightly gritty. Included in mapping were a few uneroded and severely eroded places. Shallow gullies have formed in some places, and a few small areas are somewhat steeper than 5 percent.

Controlling erosion is the most important problem of management on this soil. Seepage or wet spots can be drained with tile. All natural waterways should be kept in sod. This soil holds a good supply of moisture available for plants.

MUIRKIRK SERIES

The Muirkirk series consists of deep, well-drained to somewhat excessively drained soils that have a very thick, sandy surface layer and a red clay subsoil. These soils developed in a fairly thin mantle of sand underlain by thick deposits of very old clay.

The Muirkirk soils are not very extensive in the county and are mostly in areas of residential expansion. The native vegetation consists of scrub hardwoods and a considerable amount of Virginia pine.

Muirkirk Loamy Sand, 0 to 5 percent slopes, Moderately Eroded. (MzB2). This is the soil described for the Muirkirk series. Its chiefly limitations are the hazard of erosion and the sandiness of the thick surface layer. A few spots are severely eroded.

Muirkirk Loamy Sand, 5 to 10 percent slopes, Moderately Eroded. (MzC2). Because this soil is fently sloping to sloping the erosion hazard is more important than sandiness and is the primary problem of management. A few small areas are severely eroded.

RUMFORD SERIES

The Rumford series consists of deep, well-drained soils that developed in sandy materials containing some clay but little silt. These soils are on nearly level to strongly sloping uplands of the Coastal Plain. The Rumford soils are fairly well distributed in the county but are of only moderate extent.

Rumford Loamy Sand, 2 to 5 percent slopes, Moderately Eroded. (RdB2). Except for steeper slopes, this soil is like Rumford loamy sand, 0 to 2 percent slopes. The risk of erosion is moderate. The surface layer contains a considerable amount of medium and coarse sand. This soil is sandy. Productivity is limited because only small amounts of moisture and plant nutrients are available to plants. Conservation practices are needed.

Rumford Loamy Sand, 5 to 10 percent slopes, Moderately Eroded. (RdC2). Because this soil is on hillsides, it is susceptible to erosion. Medium and coarse sand are dominant in the surface layer. Some of the original surface soil has been lost through erosion, but the subsoil material has been exposed only in a few places where shallow gullies have formed.

Erosion is likely and only small amounts of moisture and nutrients are available to plants. The hazard of erosion is fairly high. This soil is low in available moisture and in plant nutrients.

Rumford Loamy Sand, 5 to 10 percent slopes, Severely Eroded. (RdC3). The original thick surface layer and the subsurface layer of this soil have been almost entirely lost through erosion. The soil is shallow to the underlying sandy material, and the sandy surface layer contains much reddish subsoil material. Gullies have formed in some places.

Because the erosion hazard is high, all conservation measures that can be applied are needed.

Rumford Loamy Sand, 10 to 15 percent slopes, Moderately Eroded. (RdD2). This is the steepest mapping unit of Rumford loamy sand in the county. The surface layer is dominantly medium and coarse sand. Some of the original surface soil has been lost through erosion, but subsoil material has been exposed only in a few places, where shallow gullies have formed.

SANDY LAND

Sandy Land is a miscellaneous land type that consists of sandy Coastal Plain sediments exposed mainly on the steep slopes along ravines and stream valleys. It is mostly in the southern part of the county, but some areas are in other parts. The land type is made up mostly of the same kind of sandy material that underlies the Evesboro, Galestown, Sassafras, Westphalia, and other soils in the county.

Sandy Land, Steep. (SaE). In some parts of this land type, the sand is mostly fine, and there is no gravelly material. In other parts there is a considerable amount of smooth, mostly fine gravel. Locally, there is some development in the subsoil and some accumulation of clay at a moderate depth.

A large acreage of this mapping unit has been severely eroded, but erosion affects present use very little. Large areas have reverted to trees, some are in brush, and others have been cleared.

SANDY AND CLAYEY LANDS

Sandy and clayey lands occur mainly in the northern and western parts of the county. Their soil material consists primarily of very old deposits of clay in the upper part of the Coastal Plain sediments that have been covered by a mantle of various kinds of material. In fairly large areas, this mantle consists mostly of sand, but it contains some silt and clay and, in places, much fine, smooth gravel. In even larger areas, the material in the surface layer is mainly silty, or silty and sandy, but these areas are intricately mixed on the landscape.

The mixed soil materials of these lands have variable but normally low moisture-holding capacity. These lands contain only a small amount of plant nutrients and are not productive, even under good management.

Some areas are cultivated, some have been stripped for mining clay, but most are idle, are wooded, or are used for community development.

The soil materials of these lands, especially where they have been disturbed, have poor stability, which limits them for most uses and even makes them dangerous for some uses. They may be squeezed out from under building foundations and allow the footings or basements to crack and settle. Occasionally, property is damaged and people are killed or injured when fills consisting of these materials collapse.

Sandy and Clayey Land, Gently sloping. (ScB). This gently sloping land type has a dominantly sandy surface layer.

Sandy and Clayey Land, sloping. (ScC). Because this land type has fairly strong slopes, the hazard of erosion is high. Determining the amount of erosion is difficult because the horizons, or layers, are not genetically related. The underlying clay may be at or near the surface or deep beneath the sandy material.

Sandy and Clayey Land, Moderately Steep. (ScD). This moderately steep land type is so erodible and so unstable that it is not suited to cultivated crops or to some other uses. Well-sodded areas can be used safely for pasture. The kinds of suitable plants range from grasses to trees, all the plants used should have a deep, extensive root system to help protect against erosion and against slipping and flowing.

SILTY AND CLAYEY LANDS

Silty and clayey lands are miscellaneous land types that are similar to Sandy and clayey lands. Three units of Silty and clayey land have been mapped in Prince George's County according to their slope.

Silty and Clayey Land, Gently sloping. (SpB). In this mapping unit, the surface layer is dominantly silty. The moisture-holding capacity is high, but productivity is fairly low. Erosion is difficult to control.

Silty and Clayey Land, sloping. (SpC). On this sloping land the hazard of erosion is high.

Silty and Clayey Land, steep. (SpE). This land is too steep for safe cultivation and too unstable for many other uses. It should be kept under permanent cover of deep-rooted protective plants.

SASSAFRAS SERIES

The Sassafras series consists of deep, well-drained soils that developed in silty and clayey sand that is gravelly in places. These soils occur on nearly level to rolling or very steep uplands of the Coastal Plain. The Sassafras soils are extensive and are well distributed in the county.

The Sassafras soils are extensive in many parts of the county and are important for farming. Also, they are well suited to residential and industrial development. The native vegetation is mixed upland hardwoods, mainly oak, but local areas have a considerable amount of Virginia pine and some loblolly pine.

Sassafras Gravelly Sandy Loam, 5 to 10 percent slopes, Severely Eroded. (SgC2). This soil is shallower to the underlying material than Sassafras gravelly sandy loam, 5 to 10 percent slopes, moderately eroded. Most of the original surface soil has been removed through erosion, and the surface layer now contains much sticky subsoil material and a large amount of gravel. In a few places some shallow gullies have formed. The subsoil contains a considerable amount of smooth, rounded pebbles, and the underlying material commonly contains a large amount.

Sassafras Gravelly Sandy Loam, 10 to 15 percent slopes, Moderately Eroded. (SgD2). This moderately steep soil erodes readily if used in regular cultivation without protection. A moderate to fairly large amount of smooth, rounded pebbles occurs throughout the solum.

In some places the surface layer contains some subsoil material, and in other places a few shallow gullies have formed.

Sassafras Gravelly Sandy Loam, 10 to 15 percent slopes, Severely Eroded. (SgD3). This soil is somewhat similar to Sassafras gravelly sandy loam, 10 to 15 percent slopes, moderately eroded, but it has been so severely damaged by erosion that it can no longer be safely cultivated. The surface material is hard when dry and in most places contains a layer of gravel. In places gullies are few or many, and some of them are deep. Included in mapping were some areas where there are only a few fine pebbles in the profile.

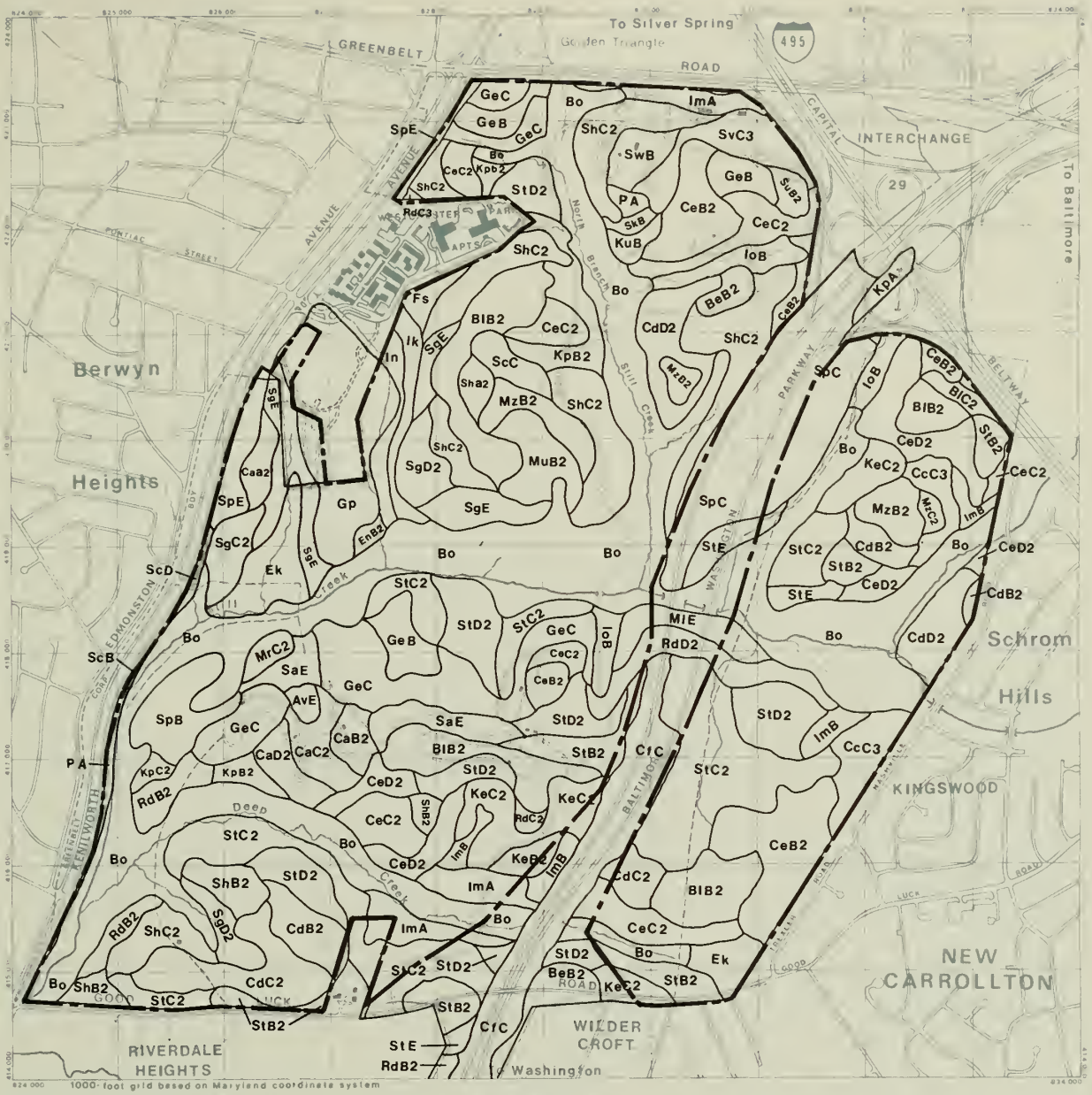
Permanent vegetation should be established on this soil. Use for community development is severely limited.

Sassafras Gravelly Sandy Loam, 15 to 30 percent slopes. (SgE). This steep soil contains a moderate to fairly large amount of smooth, rounded pebbles in the solum. Limitations on use for community development are severe.

Sassafras Sandy Loam, 2 to 5 percent slopes, Moderately Eroded. (ShB2). Except for slopes, this soil is like Sassafras sandy loam, 0 to 2 percent slopes. Erosion is likely unless conservation mearsures are used. The moisture-holding capacity is good. Keeping waterways in sod is beneficial.

Sassafras Sandy Loam, 5 to 10 percent slopes, Moderately Eroded. (ShC2). Except that it is sloping to strongly sloping and susceptible to serious damage by erosion, this soil is like the one described for the Sassafras series. In some places the surface layer contains some of the subsoil material, and in a few areas shallow gullies have formed.

Sassafras-Urban Land Complex, 0 to 5 percent slopes. (SkB). This complex consists of Sassafras soils and disturbed land that is mainly of Sassafras soil material. These areas are used for community developments. In about 20 percent of the complex, the Sassafras soils are undisturbed. In about 50 percent they have been covered with as much as 18 inches of fill material or have had as much as two-thirds of the original soil profile cut away. The fill material may be of any texture, but most commonly it is sandy, or gravelly, or both.



AvE	Aura and Croom gravelly loam
BeB2	Beltsville fine sandy loam
BlB2	" " " "
BlC2	" " " "
Bo	Bibb silt loam
CaB2	Chillum silt loam
CaC2	" " "
CaD2	" " "
CcC3	Christiana clay
CdB2	" fine sandy loam
CdC2	" " " "
CdD2	" " " "
CeB2	" silt loam
CeC2	" " "
CeD2	" " "
CfC	" -Urban land complex
Ek	Elkton silt loam
EnB2	Elsinboro sandy loam
Fs	Fallsington sandy loam
GeB	Galestown-Evesboro loamy sands
GeC	" " " "
Gp	Gravel and borrow pits
Ik	Iuka fine sandy loam
ImA	" sandy loam
ImB	" " "
In	" silt loam
IoB	" " "
KeB2	Keyport fine sandy loam
KeC2	" " " "
KpA	" silt loam
KpB2	" " "
KpC2	" " "
KuB	" -Urban land complex
MIE	Marr fine sandy loam
MrC2	Matawan fine sandy loam
MuB2	Mattapex silt loam
MzB2	Muirkirk loamy sand
MzC2	" " "
P.A.	Paved Area
RdB2	Rumford loamy sand
RdC2	" " "
RdC3	" " "
RdD2	" " "
SaE	Sandy land
ScB	Sandy and clayey land
ScC	" " " "
ScD	" " " "
SgC2	Sassafras gravelly sandy loam
SgD2	" " " "
SgD3	" " " "
SgE	" " " "
ShB2	" sandy loam
ShC2	" " "
SkB	-Urban land complex
SpB	Silty and clayey land
SpC	" " " "
SpE	" " " "
StB2	Sunnyside fine sandy loam
StC2	" " " "
StD2	" " " "
StE	" " " "
SuB2	" loam
SvC3	" sandy clay loam
SwB	" -Urban land complex
SwC	" " " "

N

Source: U.S.D.A., Soil Conservation Service
Soil report on Prince Georges Co., Md., 1967.

500 0 500 1000 1500 2000 Feet

200 100 0 200 400 600 Meters

1000-foot grid based on Maryland coordinate system

SOIL UNITS
GREENBELT PARK
MARYLAND

UNITED STATES DEPARTMENT OF THE INTERIOR / NATIONAL PARK SERVICE

843 | 40,009
DSC | JUNE '80

APPENDIX H:

ENVIRONMENTAL QUALITY

CLIMATOLOGICAL SUMMARY

COLLEGE PARK, MD **1951 - 1974** **38° 59' N** **76° 57' W** **90 FT.**

MONTH	TEMPERATURE (°F)													PRECIPITATION TOTALS (INCHES)												
	MEANS			EXTREMES						MEAN NUMBER OF DAYS									SNOW, SLEET						MEAN NUMBER OF DAYS		
										MAX.		MIN.															
	DAILY MAXIMUM	DAILY MINIMUM	MONTHLY	RECORD HIGHEST	YEAR	DAY	RECORD LOWEST	YEAR	DAY	90° AND ABOVE	32° AND BELOW	32° AND BELOW	0° AND BELOW	MEAN	GREATEST MONTHLY	YEAR	GREATEST DAILY	YEAR	DAY	MEAN	MAXIMUM MONTHLY	YEAR	GREATEST DEPTH	YEAR	DAY	.10 or MORE	.50 or MORE	1.00 or MORE
JAN	44.0	24.9	34.5	73*	67	24	-9*	61	22	0	4	24	1	2.59	4.41	64	1.56	68	14	4.4	18.2	66	17.0	66	31	6	2	0
FEB	47.0	26.4	36.7	76	54	16	-4	67	8	0	2	21	0	2.97	6.83	72	1.80	72	19	4.7	16.0	67	15.0	61	4	6	2	0
MAR	55.7	33.1	44.4	85	63	30	-1	60	11	0	0	15	0	3.62	7.09	53	3.43	58	20	2.8	16.3	60	9.0	60	9	7	2	1
APR	68.0	42.7	55.4	95	60	23	18	69	1	0	0	4	0	3.59	7.21	73	2.30	70	14	.0	.8	72				8	2	1
MAY	77.2	52.1	64.7	97*	69	30	30	66	11	2	0	0	0	3.66	7.54	71	2.51	71	13	.0						7	3	1
JUN	85.1	60.9	73.0	102	59	30	40	67	1	9	0	0	0	4.06	11.78	72	5.23	72	22	.0						6	3	1
JULY	88.8	65.6	77.2	104	54	31	48*	52	2	14	0	0	0	3.58	10.00	58	3.87	58	9	.0						6	2	1
AUG	86.9	63.9	75.4	101*	55	2	43	52	25	11	0	0	0	5.02	14.73	55	5.50	55	13	.0						6	3	2
SEPT	80.9	57.1	69.0	102*	53	1	33	56	21	5	0	0	0	3.11	8.59	66	5.30	66	14	.0						5	2	1
OCT	70.0	45.4	57.7	94	51	5	23	52	21	0	0	3	0	2.77	7.39	71	4.15	55	14	.0						4	2	1
NOV	57.4	35.9	46.7	85	71	2	14	51	28	0	0	13	0	3.23	7.32	52	3.13	52	21	1.0	9.5	67	10.0	67	30	5	2	1
DEC	46.6	28.2	37.4	74	51	7	-3	60	23	0	2	21	0	3.46	7.10	69	1.69	72	9	3.9	15.2	62	12.0	60	12	6	3	1
YEAR	67.3	44.7	56.0	104	54	JUL 31	-9*	61	JAN 22	41	8	101	1	41.66	14.73	AUG 55	5.50	AUG 55	13	16.8	18.2	JAN 66	17.0	JAN 66	31	72	28	11

Source: Climate of Maryland - 1977.
National Oceanic and
Atmospheric Administration
National Climatic Center

RESULTS OF SAMPLING INDIAN CREEK AT GREENBELT ROAD

Date	Temperature °C	Fecal Coliforms per 100 ml.	pH	DO mg 1
12-18-73	0.3	43	6.2	12.2
1-22-74	5.0	430	6.0	9.8
2-25-74	5.0	290	7.1	12.2
3-27-74	10.0	230	7.5	9.2
4-23-74	18.0	2,300	6.5	6.0
6-25-74	19.0	4,300	7.3	8.1
7-23-74	20.5	430	6.5	8.0
8-27-74	27.0	23,000	7.4	7.6
9-23-74	13.0	9,300	6.6	7.5
10-29-74	16.0	750	6.1	9.1
11-26-74	5.0	230	5.4	11.4
12-31-74	4.0	2,300	6.9	12.2
1-28-75	5.0	230	6.8	10.8
2-25-75	10.0	2,100	6.8	10.6
3-24-75	10.0	230	6.9	9.0
4-22-75	13.0	93	7.3	10.9
5-26-75	20.0	3,900	7.4	6.6
7-28-75	24.5	430	7.3	8.2
8-25-75	27.0	210,000	7.2	9.0
9-22-75	18.0	430	7.6	8.8
10-27-75	13.5	15,000	7.5	9.0
11-24-74	4.0	23,000	4.8	13.5
12-15-75	5.5	230	---	12.4
11-26-76	4.0	4,300	7.2	7.2
12-23-77	4.0	230	6.5	6.5

SUMMARY OF WATER QUALITY STANDARDS FOR THE STATE OF MARYLAND

CLASS OF WATER	BACTERIOLOGICAL	DISSOLVED OXYGEN (mg/l)		TEMPERATURE	pH[1]		TURBIDITY IN RECEIVING WATER[2] (JTU)	
		MINIMUM DAILY AVERAGE			MINIMUM	MAXIMUM	MONTHLY AVERAGE	MAXIMUM ALLOWABLE
Class I--Water Contact Recreation and Aquatic Life	Fecal coliform not to exceed a log mean of 200/100 ml	4.0	5.0	Elevations above natural not to exceed 5°F	6.5	8.5	50	150
Class II--Shellfish Harvesting	Most probably numbers of coliform organisms not to exceed a median of 70/100 ml.	4.0	5.0	Elevations limited to 40°F in June to August	6.5	8.5	50	150
Class III--Natural Trout Waters	Same as Class I.	5.0	6.0	No significant changes (cannot exceed 68°F)	6.5	8.5	50	150
Class IV--Recreational Trout Waters	Same as Class I.	4.0	5.0	Not to exceed 75°F	6.5	8.5	50	150

[1]Standards apply where, and to the extent that, lower values occur naturally.

[2]Within limits of best practicable control technology currently available, turbidity may not exceed, for extended periods of time, those levels normally prevailing during periods of base flow in the surface waters.

Source: Maryland Receiving Water Quality Standards. Water Resources Administration Regulation 08.05.04.03, effective September 1, 1974. Maryland Annotated Code, Title 8.

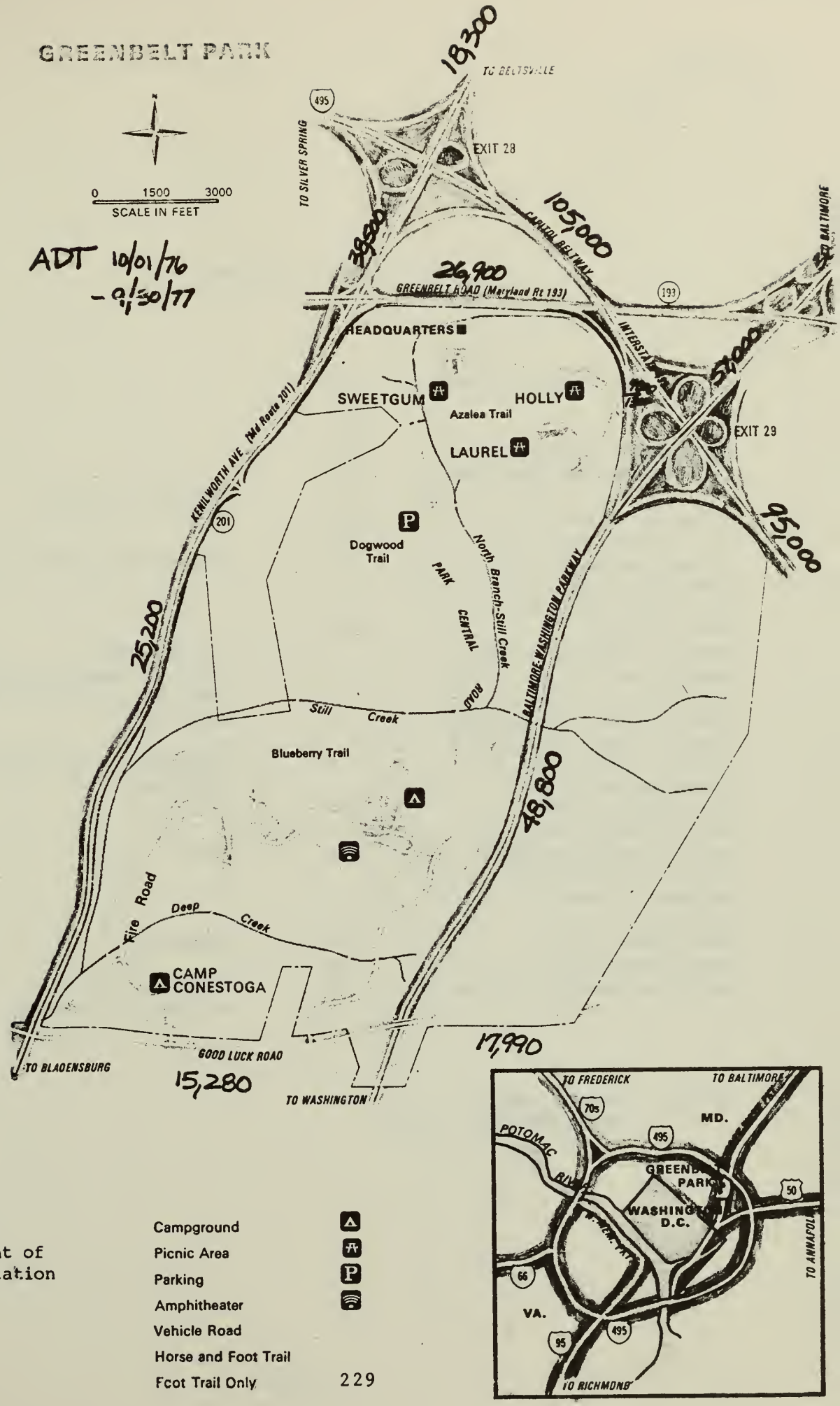
Ambient Air Quality Standards

	National		State	
	Primary	Secondary	Serious	More Adverse
Sulfur Oxides				
Annual Arithmetic Mean, ug/m^3	80		79	39
24-hour Maximum[b], ug/m^3	365		262	131
3-hour Maximum[b], ug/m^3		1,300		
1-hour Maximum[c], ug/m^3			525	262
Particulate Matter				
Suspended				
Annual Arithmetic Mean, ug/m^3	75[a]	60[a]	75	65
24-hour Maximum[b], ug/m^3	260	150	160	140
Settleable				
Annual Arithmetic Average, mg/cm^2/month			0.5	0.35
Monthly Maximum			1.0	0.7
Carbon Monoxide				
8-hour Maximum[b], ug/m^3	10	10	10	10
1-hour Maximum[b], ug/m^3	40	40	40	40
Hydrocarbons				
3-hour (6-9 am) Maximum[b], ug/m^3	160	160	160	160
Nitrogen Dioxide				
Annual Arithmetic Mean, ug/m^3	100	100	100	100
Photochemical Oxidants				
1-hour Maximum[b], ug/m^3	160	160	160	160

a - annual geometric mean
b - not to be exceeded more than once per year
c - not to be exceeded more than once per month

ug/m^3 = micrograms per cubic meter

SOURCE: State of Maryland, Bureau of Air Quality Control



Source: Maryland Department of Transportation

- Campground
- Picnic Area
- Parking
- Amphitheater
- Vehicle Road
- Horse and Foot Trail
- Foot Trail Only

NOISE LEVELS IN DECIBELS

Large rocket engine (nearby)	180	
	170	
	160	
Jet takeoff (nearby)	150	
Carrier deck jet operation	140	
		Threshold of pain
Hydraulic press (1 m)	130	
Jet takeoff (60 m)	120	
Automobile horn (1 m)		Maximum vocal effort possible
Construction noise (3 m)	110	
Jet takeoff (600 m)		
Shout (15 cm)	100	
Subway station or train		Very annoying
Heavy truck (15 m)	90	Constant exposure endangers hearing
Inside car in city traffic		Limit for industrial exposures
Noisy office with machines	80	Annoying
Freight train (15 m)		
Freeway traffic (15 m)	70	Telephone use difficult
Conversation (1 m)		Intrusive
Accounting office	60	
Light traffic (15 m)		
Private business office	50	Quiet
Living room in home		
Bedroom in home	40	
Library		
Soft wisper (5 m)	30	Very quiet
Broadcast studio	20	
Rustling leaves in breeze	10	Barely audible
	0	Threshold of hearing

SOURCE: Hodges. 1973.
Environmental Pollution

APPENDIX I:

SPECIES LISTS

PARTIAL LIST OF PLANT SPECIES FOUND IN GREENBELT PARK

Common Name	Scientific Name
Apple	Malus pumila
Arrowwood, Southern	Viburnum dentatum
Azalea, Flame	Rhododendron caledulaceum
Azalea, Pink	R. nudiflorum
Beardtongue	Penstemon spp.
Beech, American	Fagus grandifolia
Birch, Yellow	Betula allegheniensis
Blackberry	Rubus spp.
Black-eyed Susan	Rudbeckia hirta
Blackgum	Nyssa sylvatica
Blueberry, Low Sweet	Vaccinium augustifolium
Blueberry, High-bush	V. corymbosum
Bluets	Houstonia caerulea
Broomsedge	Andropogon virginicus
Buttercup	Ranunculus acris
Cattail	Typha latifolia
Cedar, Red	Juniperus virginiana
Cherry, Black	Prunus serotina
Chestnut, American	Castanea americana
Chickweed	Stellaria media
Chicory, Common	Chichorium intybus
Chinquapin	Castanea pumila
Clover, Alsike	Trifolium hybridum
Cottonwood	Populus deltoides
Daisy, Ox-eye	Chrysanthemum leucanthemum
Daisy Fleabane	Erigeron annuus
Dayflower	Commelina communis
Deerberry	Vaccinium stamineum
Dogwood, Flowering	Cornus florida
Fern, Bracken	Pteridium aquilinum
Fern, Christmas	Polystichvm acrostichoides
Fern, Cinnamon	Osmunda cinnomomea
Geranium, Wild	Geranium maculatum
Goldenrod	Solidago spp.
Greenbrier	Smilax rotundifolia
Ground Cedar	Lycopodium tristachyum
Ground Ivy	Glechoma hederacea
Ground Pine	Lycopodium obscurum
Hawkweed, Field	Hieracium pratense
Hawthorn	Crataegus spp.
Hickory Bitternut	Carya cordiformis
Hickory, Pignut	C. glabra
Hickory, Shagbark	C. orata
Holly, American	Ilex opaca
Honeysuckle, Janpanese	Lonicera japonica
Hornbeam, American	Carpinus caroliniana

Common Name	Scientific Name
Horse-nettle	Solanum carolinense
Huckleberry	Gaylussacia spp.
Indian Pipe	Monotropa uniflora
Jack-in-the-Pulpit	Arisaema triphyllvm
Jewelweed	Impatiens pallida
Jonquil, Wild Double	Narcissus jonquilla
Laurel, Mountain	Kalmia latifolia
Locust, Black	Robinia pseudoacacia
Magnolia, Sweetbay	Magnolia virginiana
Maple, Red	Acer rubrum
Maple, Sugar	A. saccharum
May-apple	Podophyllum peltatum
Mayweed	Anthemis cotula
Merrybells	Uvularia sessilifolia
Milkweed, Common	Asclepias syriaca
Milkweed, Four-leaved	A. quadrifolia
Milkweed, Tall	A. exaltata
Moccasin-flower	Cypripedium acaula
Morning Glory	Ipomoea purpvrea
Mullein, Common	Verbascum thapsus
Oak, Black	Quercus velutina
Oak, Blackjack	Q. marilandica
Oak, Chestnut	Q. prinus
Oak, Post	Q. stellata
Oak, Scarlet	Q. coccinea
Oak, Southern Red	Q. falcata
Oak, White	Q. alba
Oak, Willow	Q. phellos
Onion, Wild	Allium oxyphilum
Partridgeberry	Mitchella repens
Partridge Pea	Cassia fasciculata
Periwinkle	Vinca minor
Persimmon	Diospyros virginiana
Pin Cherry	Prunus pensylvanica
Pine, Pitch	Pinus rigida
Pine, Virginia	P. virginiana
Pokeweed	Phytolacca americana
Primrose, Common Evening	Oenothera biennis
Pipsissewa	Chimaphila umbellata
Queen Anne's Lace	Daucus carota
Raspberry	Rubus spp.
Rattlesnake Plantain	Goodyera spp.
Redbud	Cercis canadensis
Rockcress, Lyreleaf	Arabis lyrata
Rose, Pasture	Rosa carolina
Sassafras	Sassafras albidum
Selfheal	Prunella vulgaris
Skunk Cabbage	Symplocarpus foetidus
Solomon's Seal	Polygonatum biflorum
Solomon's Seal, False	Smilacina racemosa
Spring Beauty	Claytonia virginica
St.Johnswort	Hypericum perforatum
Sumac, Poison	Toxicodendron vernix
Sumac, Staghorn	Rhus typhina
Sumac, Winged	R. copallina

Common Name	Scientific Name
Sweetgum	*Liquidambar styraciflua*
Sycamore	*Platanus occidentalis*
Thistle, Bull	*Cirsium pumilum*
Thistle, Common	*C. vulgare*
Trailing Arbutus	*Epigaea repens*
Tree of Heaven	*Ailanthus altissima*
Tulip Poplar	*Liriodendron tulipifera*
Turk's-cap lily	*Lilium superbum*
Vetch	*Viccia spp.*
Violet, Common Blue	*Viola papilionales*
Violet, Sweet White	*V. blanca*
Wintergreen, Spotted	*Chimaphila maculata*
Yucca	*Yucca filamentosa*

Source: Robert L. Kempf
Park Ranger
Greenbelt Park

PARTIAL LIST OF SPECIES OF WILDLIFE FOUND IN GREENBELT PARK

Common Name	Scientific Name
Cardinal	Richmondena cardinalis
Chickadee, Carolina	Parus carolinensis
Crow, Common	Crovus brachyrhynchos
Dove, Mourning	Zenaidura macroura
Flicker	Colaptes auratus
Fox, Red	Vulpes fulva
Frog, Leopard	Rana pipiens
Goldfinch, American	Spinus tristis
Hawk, Red-tailed	Buteo jamaicensis
Jay, Blue	Cyanocitta cristata
Junco, Slate-colored	Junco hyemalis
Lizard, Fence	Sceloporus occidentalis
Mockingbird	Mimus polyglottos
Mouse, White-footed	Peromyscus leucopus
Nuthatch, White-breasted	Sitta carolinensis
Opossum	Didelphis marsupialis
Owl, Great Horned	Bubo virginianus
Quail, Bob-white	Colinus virginianus
Rabbit, Eastern Cottontail	Sylvilagus floridanus
Raccoon	Procyon lotor
Redstart, American	Setophaga ruticilla
Robin	Turdus migratorius
Skink, Five-lined	Eumeces fasciatus
Skunk, Striped	Mephitis mephitis
Snake, Black	Elaphe obsoleta
Snake, Eastern Hognose	Heterodon platyrhinos
Snake, Northern Ringneck	Diadophis punctatus
Sparrow, House	Passer domesticus
Sparrow, Vesper	Pooecetes gramineus
Sparrow, White-throated	Zonotrichia albicollis
Squirrel, Flying	Glaucomys volans
Squirrel, Gray	Sciurius carolinensis
Starling	Sturnus vulgaris
Tanager, Scarlet	Piranga olivacea
Tanager, Summer	P. rubra
Thrasher, Brown	Toxostoma rufum
Thrush, Gray-cheecked	Hylocichla minima
Thrush, Wood	H. mustelina
Titmouse, Tufted	Parus bicolor
Toad, Common American	Bufo terrestris
Towhee, Rufous-Sided	Pipilo erythrophthalmus
Turtle, Box	Terrapene carolina
Warbler, Hooded	Wilsonia citrina
Warbler, Myrtle	Dendroica coronata
Whip-poor-will	Caprimulgus vociferus
Woodchuck	Marmota monax
Woodcock, American	Philohela minor
Woodpecker, Downy	Dendrocopus pubescens
Woodpecker, Hairy	D. villosus
Woodpecker, Red-bellied	Centurus carolinus

Source: Field Studies, February 1979 and Robert L. Kempf, Park Ranger

APPENDIX J:

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APPENDIX K:

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TEAM MEMBERS

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